FEBRUARY 4, 1957

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

production ideas
NO. 8 OF A SERIES

Pieces by the Slice

Hot extruded steel shapes trim machining and material costs . . . page 101

✔ Slump Ahead? Don't Cry Wolf —pages 57, 59, 77

✔ Steel Buyers Are Optimistic —page 149

CONTENTS — PAGE 5

SIMPLIFYING HEAT EXCHANGER AND CONDENSER FABRICATION

The ease with which heat exchanger and condenser tubes can be rolled into tube sheets depends, to a certain extent, upon the uniformity of tube wall. One of the controlling factors of wall uniformity in the manufacture of seamless steel tubing is the contour of the piercer point.

Phil Morrison, a piercer point man, is shown at work on one of B&W's seamless tube mills. One of his duties is to examine the piercer point between each tube making operation. By making certain that the point has not been deformed in service—and that takes experience and a practiced eye—he helps to control wall uniformity in the pierced tube. He knows that although hot and cold work after the piercing operation can minimize, it cannot eliminate non-uniformity of wall section.

Phil's attention to detail, teamed with specially designed piercing equipment, helps to achieve the quality—"ease of rolling-in"—for B&W Heat Exchanger and Condenser Tubes. The Babcock & Wilcox Company, Tubular Products Division, Beaver Falls, Pa.

TA-6051-G1

Seamless and welded tubular products, seamless welding fittings and forged steel flanges in carbon, alloy and stainless steels

WIRE WITH A TIGHT BOND OF PURE ZINC FIGHTS RUST...

Campbell furnishes "Inco" pattern coil chain of weldless design to builders of quality gym sets and backyard swings. The bright sparkle of the bethanized zinc coating adds sales appeal besides protecting against rust.

summer and winter

This handy chain applier, made from bethanized wire, is clamped on the tire, the ends of the chains are hooked to the prongs, and the car is moved forward. Campbell tire chains are also made from Bethlehem steel.

It's bethanized wire. And like so many users, Campbell Chain Company, York, Pa., a leading chain manufacturer, finds bethanized ideal for wire products that must withstand severe forming and still have more than ordinary rust-resistance.

In making weldless chain of double-loop design, Campbell has no trouble with the zinc cracking or flaking off in the forming and knotting operation. For example, they use 12-gage bethanized wire of medium temper for making size No. 1 of their "Inco" pattern. The finished chain is smooth, easy on the hands. And it has the bright sparkle so typical of bethanized wire. Most important of all, the pure zinc coating is intact even on the severe twists.

The bethanized coating is locked on, atom by atom, by our unique electrolytic process. Thanks to this tight bond, plus the purity of the zinc, the coating is highly ductile and can stand severe forming. Twist it, wrap it, weave it — even draw it through dies — and the pure zinc armor stays put.

We offer a choice of four standard coating weights to meet a variety of service conditions. If you're looking for a tightly bonded, uniform coating and dependable resistance to corrosion, you'll like bethanized wire. And it costs very little more than ordinary galvanized wire. Our nearest sales office will gladly arrange a trial shipment.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

FREE... Aluminum Facts from FRASSE

IF you're involved in aluminum procurement or fabrication . . . you should have this new illustrated brochure prepared by Frasse.

Packed with easy-to-find, easy-to-read data about the most used commercial aluminum alloys—it covers in detail general properties, fabricating characteristics, typical applications, and weight comparisons. Also included are alloy and temper designation charts . . . plus available size ranges for each alloy.

Frasse offers well balanced stocks of aluminum, practical engineering assistance in their application and speedy delivery. Let this combination work for you by making Frasse your source for aluminum. For your free Frasse brochure — and complete, quick aluminum service — write or call the Frasse office nearest you.

GRADES COVERED INCLUDE:

1100 (2S)	3003 (3S)
2011 (11S)	5052 (52S)
2017 (17S)	6061 (61S)
2024 (24S)	6063 (63S)

7075 (75S)

Call FRASSE 1st for ALUMINUM

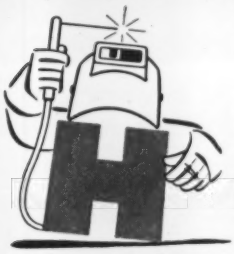
Screw Machine Stock • Rounds
Squares • Hexagons • Rectangles
Angles • Channels • Plates • Pipe
Tubing • Fittings • Extrusions

Peter A. Frasse and Co., Inc.

Distributor of Reynolds Aluminum

NEW YORK 13, N.Y.	PHILADELPHIA 29, PA.	BUFFALO 7, N.Y.	SYRACUSE 1, N.Y.	HARTFORD 1, CONN.
17 Grand St.	3911 Wissahickon Ave.	P. O. Box K, Station B.	P.O. Box 1267	P.O. Box 1949
WAlker 5-2200	BAldwin 9-9900	BEdford 4700	SYracuse 73-5241	CHapel 6-8835

LYNDHURST • ROCHESTER • BALTIMORE

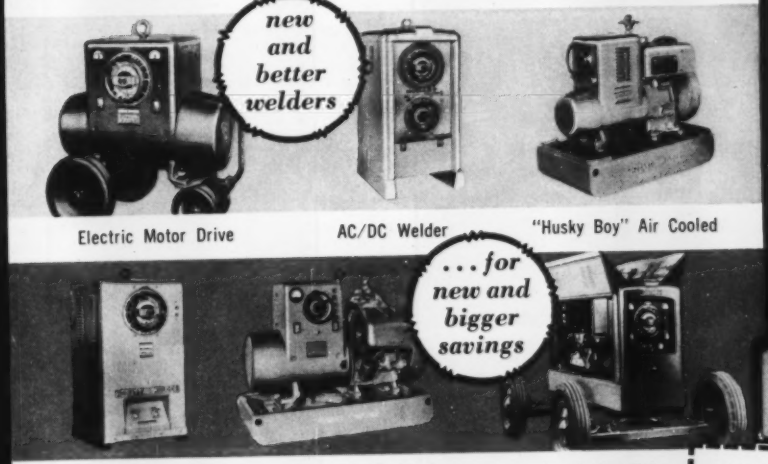


here's the new HOBART rectifier welder designed to give you

extra cost-cutting advantages

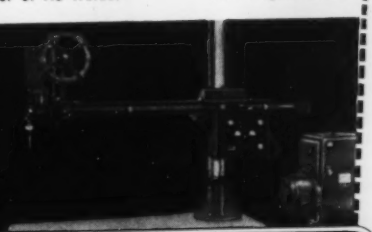
Low operating cost is only one of the many new features you get in the new Hobart DC Rectifier. Hobart's new design, "diverter path," brings smoother welding with an exceptionally easy striking arc. New and simplified controls give the operator infinite welding settings for any number of machine adjustments for various types of electrodes and positions. Remote control, fast acting polarity switch and other convenience features all at no extra cost. You'll be amazed at the wide welding range and performance of Hobart's DC Rectifier Arc Welder. It's the biggest welder value on the market today. Phone or write now for complete specifications and prices to HOBART BROTHERS COMPANY, BOX ST-27, TROY, OHIO, 'Phone FEderal 2-1223.

The Most Complete Line of Arc Welders on the Market.



automatic welding

With Hobart's New Simplified Controls, it's easy for any metal working shop to take advantage of automatic and semi-automatic welding. No more elaborate or complicated installations. Check coupon for more details.



HOBART TROY OHIO **WELDERS**

. . . and ELECTRODES for every purpose

HOBART BROTHERS COMPANY
BOX ST-27, TROY, OHIO

Without obligation, send complete information on:

_____ *ampere capacity*

- ☐ *DC Rectifier*
- ☐ *Electric Motor Drive*
- ☐ *AC-DC Welder*
- ☐ *"Husky Boy" Air Cooled*
- ☐ *AC Transformer*
- ☐ *AC Power/AC Welder*
- ☐ *Gas Engine Drive*
- ☐ *Automatic Arc Welding*
- ☐ *Semi-automatic Welding*
- ☐ *Iron Powder Electrodes*

Name _____

Address _____

City _____ *State* _____

Have you tried the NEW and faster Hobart iron powder electrodes? Keep pace with faster production and lower cost welding. Hobart's "Rocket 24," hi-speed iron powder electrodes are especially designed for using the "drag" technique. Deposition rate is much higher than conventional type electrodes. Beads are smooth. Slag is practically self removing. Get more inches of weld per electrode. For proof—try a few "Rocket 24" electrodes on your own work.

Hobart *"one of the world's largest builders of arc welding equipment"*

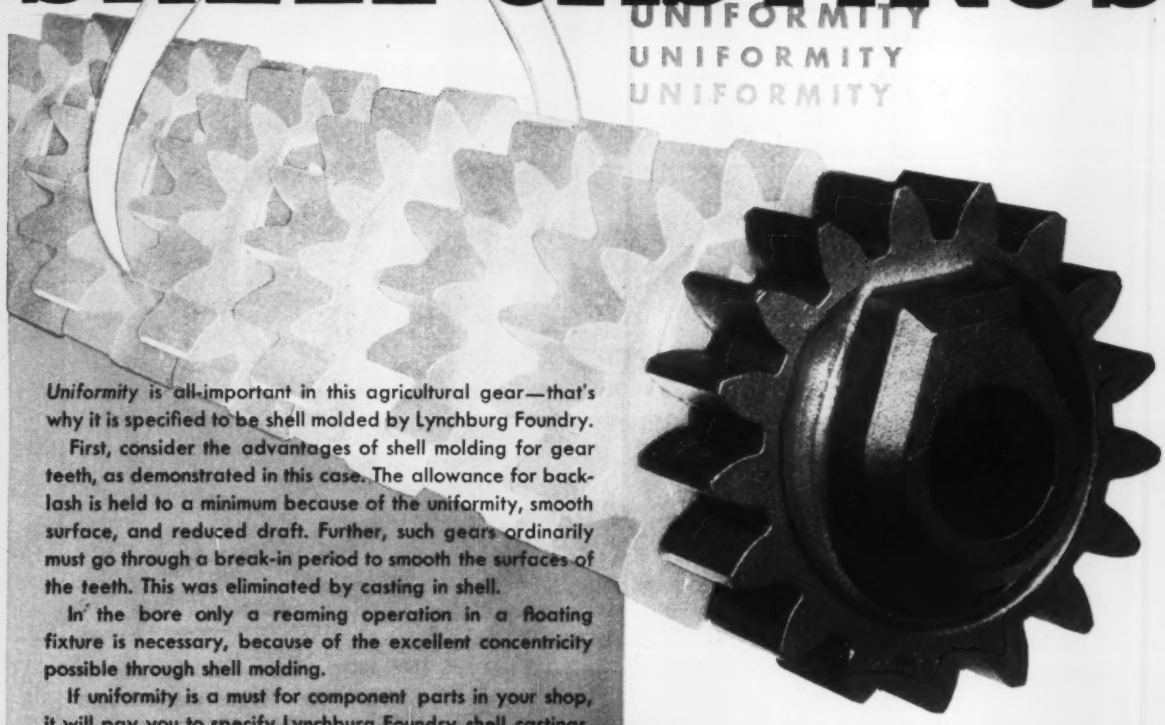
GRAY IRON AND DUCTILE IRON—

Heat treated or as cast

UNIFORMITY
UNIFORMITY
UNIFORMITY
UNIFORMITY
UNIFORMITY
UNIFORMITY
UNIFORMITY
UNIFORMITY
UNIFORMITY
UNIFORMITY

LYNCHBURG FOUNDRY

SHELL CASTINGS



Uniformity is all-important in this agricultural gear—that's why it is specified to be shell molded by Lynchburg Foundry.

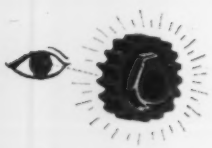
First, consider the advantages of shell molding for gear teeth, as demonstrated in this case. The allowance for backlash is held to a minimum because of the uniformity, smooth surface, and reduced draft. Further, such gears ordinarily must go through a break-in period to smooth the surfaces of the teeth. This was eliminated by casting in shell.

In the bore only a reaming operation in a floating fixture is necessary, because of the excellent concentricity possible through shell molding.

If uniformity is a must for component parts in your shop, it will pay you to specify Lynchburg Foundry shell castings.

LESS MACHINING—Close control of dimensions means less machining, faster machining methods, or in some instances elimination of machining altogether.

MADE FOR LIGHT TRAVEL—Less machine stock means reduced weight—lowering transportation costs both in shipment and within the factory.



SUPERIOR SURFACE FINISH—Shell castings have "eye appeal"—their surface dresses up any finished product. Further, a smooth finish reduces wear on machine tools.

LFC

LYNCHBURG FOUNDRY COMPANY

LYNCHBURG, VIRGINIA

•

DISTRICT SALES OFFICES

50 BROAD ST., NEW YORK, N.Y.

122 SOUTH MICHIGAN AVE., CHICAGO, ILL.

1783 E. 11TH ST., CLEVELAND, OHIO

IN THIS ISSUE

STEEL
The Metalworking Weekly

February 4, 1957
Vol. 140 No. 5

METALWORKING OUTLOOK

53 **In 1957, the Canadian boom will continue strong.** Capital outlays will rise above 1956's record $7.5 billion (Canadian)

59 **Capital equipment makers far from gloomy** over prospects for '57

60 **Industrial furnace sales forecast for 1957:** Close to peacetime record

61 **How to recruit, hold Ph.D.'s**—Freedom urged for scientists and engineers

62 **A. O. Smith Corp. forms subsidiary** to help solve engineering problems

63 **Ports race seaway**—Great Lakes cities seek to overcome problems, complete adequate harbor facilities by 1959 opening date

70 **Clerical help costs more**—Average up $3 a week last year to high of $62

71 **Doubling of Canadian steel output** by 1980 predicted

89 **Convair spending millions to retool** for new jet airliner

TECHNICAL OUTLOOK

99 **Cast parts made of new aluminum alloy** are replacing high-strength forgings in F-100 Super Sabre

100 **Welding**—Sealers close all potential voids between metal parts

COVER ARTICLE

101 **Production ideas**—Hot extrusion permits you to buy parts, already shaped, by the bar. You slice them to correct length

105 **Aluminum dip coated on steel parts**—It's practical, inexpensive

108 **Progress in Steelmaking**—Planning is key to efficient maintenance

112 **Bar feeds boost output** in plant using screw machines

115 **Large furnace aids pressmaker** in annealing outsized weldments

118 **Special machine tools**—When to use them and why

MARKET OUTLOOK

147 **Ingot output runs near record**—Indexes and composites, 157; steel prices, 159; ores, 165; ferroalloys, 166; scrap trends, 169, prices 170

149 **Pinch still on in plates and structurals** despite some easing, STEEL's quarterly survey of inventories shows

172 **Nonferrous Metals**—Buyer's market returns—Prices, 174

REGULAR FEATURES

6 Behind the Scenes
10 Letters to The Editors
16 Staff
23 Calendar of Meetings
57 The Editor's Views
66 Windows of Washington
69 Management at Work
73 Mirrors of Motordom
77 The Business Trend
81 Men of Industry
86 Obituaries
123 New Products
140 New Literature
177 Advertising Index

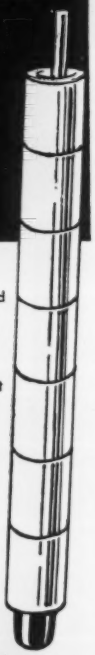
Published every Monday by The Penton Publishing Co., Penton Bldg., Cleveland 13, O. Subscriptions in the U.S. and possessions and Canada, $10 a year; all other countries, $20. Current issues, 50 cents each. Metalworking Yearbook issue, $2. Accepted as controlled circulation publication at Cleveland. Copyright, 1957, The Penton Publishing Co.

Index available semi-annually. STEEL is also indexed by Engineering Index, 29 W. 39th St., New York 18, N. Y.

℞ for Moisture-Hungry Stopper Rod Tile

WALSH MORT-AIRSET

High Temperature Air-Setting Cement Assures High Moisture Retention . . . Guarantees Stronger, Tougher, Tighter Bond For Stopper Rods



Here's a refractory cement that retains it's original moisture content when applied to "moisture-hungry" tile . . . combines smooth workability with non-shrinking qualities to produce remarkably tight impenetrable joints throughout the complete temperature range to 3000° F.

Try this cement for bonding your stopper rod tile. Note for yourself it's excellent working, drying and non-shrinking properties that deliver easier application, better bond and longer service life. Guaranteed not to "gum up" or form lumps in the drum even after extended periods of storage.

Packed in 500 lb. and 200 lb. drums and smaller steel containers.

Write for literature.

Specialists in Refractories of High Bulk Density and Low Porosity

WALSH REFRACTORIES CORPORATION

101 FERRY ST. • ST. LOUIS 7, MO.

FOR OVER 60 YEARS MANUFACTURERS OF HIGH GRADE REFRACTORIES

behind the scenes

Applause, It Says Here

We knew a man who was always willing to astound people by making impressive statements. "American Indians," he might say, swishing the olive in the dregs of his Martini, "regarded totem intermarriage as incest." Or, "The area of a regular hexagon is equal to three times the product of the apothem and one side."

This type stuff doesn't send anybody. Perhaps the information we are now poised to reveal might not send you, but we submit that whatever affects STEEL should affect its readers, too, so here goes:

During 1956, STEEL moved from fourth to second place in the number of pages of advertising carried by the nation's leading business publications. Since the number of pages carried by the leading business papers is greater than that carried by the leading general magazines, STEEL, in 1956, carried the second largest volume of advertising, measured in number of pages, of any American publication. Advertisingwise, the only magazine ahead of STEEL in 1956 was the *Oil & Gas Journal;* qualitywise, no magazine was ahead of it.

If all this is news to you, don't feel that we are taking up your time by singing STEEL's praises. The solid acceptance of this publication is a reflection of the fact that *you* read it, and advertisers are convinced that *you* are the executive board of the mighty metalworking industry.

Dapper Dave

With an eye toward further strengthening an already strong team, George O. Hays, president of the Penton Publishing Co., has announced the appointment of David C. Kiefer as business manager of STEEL. Dave came to Penton 23 years ago as a circulation salesman; he has served as district sales manager in Cleveland, regional sales manager in STEEL's central western territory and marketing director of the Penton Publishing Co. (in which capacity he will continue). It is obvious that he is eminently qualified in know-how and experience to fill this important role. We're all proud of our Davey, and are happy to note that his new responsibilities will never give him any gray hairs; indeed, in his present state, he might be inclined to welcome the addition of *any* kind of hair.

In his leisure moments, Dave is handy with firearms, water colors and cameras. He is an artist and a writer as well as a sales executive, and is possibly one of the best groomed, best looking, best informed business managers in the business paper world.

Vive la France, Mac

H. B. Trix, president of W. M. Chace Co., Detroit, was kind enough to set us straight on thermostatic bimetal. Mr. Trix is obviously an executive, a scholar and a political philosopher. After telling us that the stuff was invented in France around the middle of the 19th century, and enlarging on the history of Invar, a nickel iron alloy invented by Guillaume in 1899 as a result of a search for a metal with low thermal expansion, Mr. Trix threw in some comments on the French. "The great contributions of the French to science, medicine, literature and the arts should, perhaps, make us more tolerant and understanding of the apparent inability of the people to meet the problems of self-government. Possibly (he adds) their present difficulties arise from having too much logic and not enough conscience, plus a lack of real leadership at their highest levels of business and government."

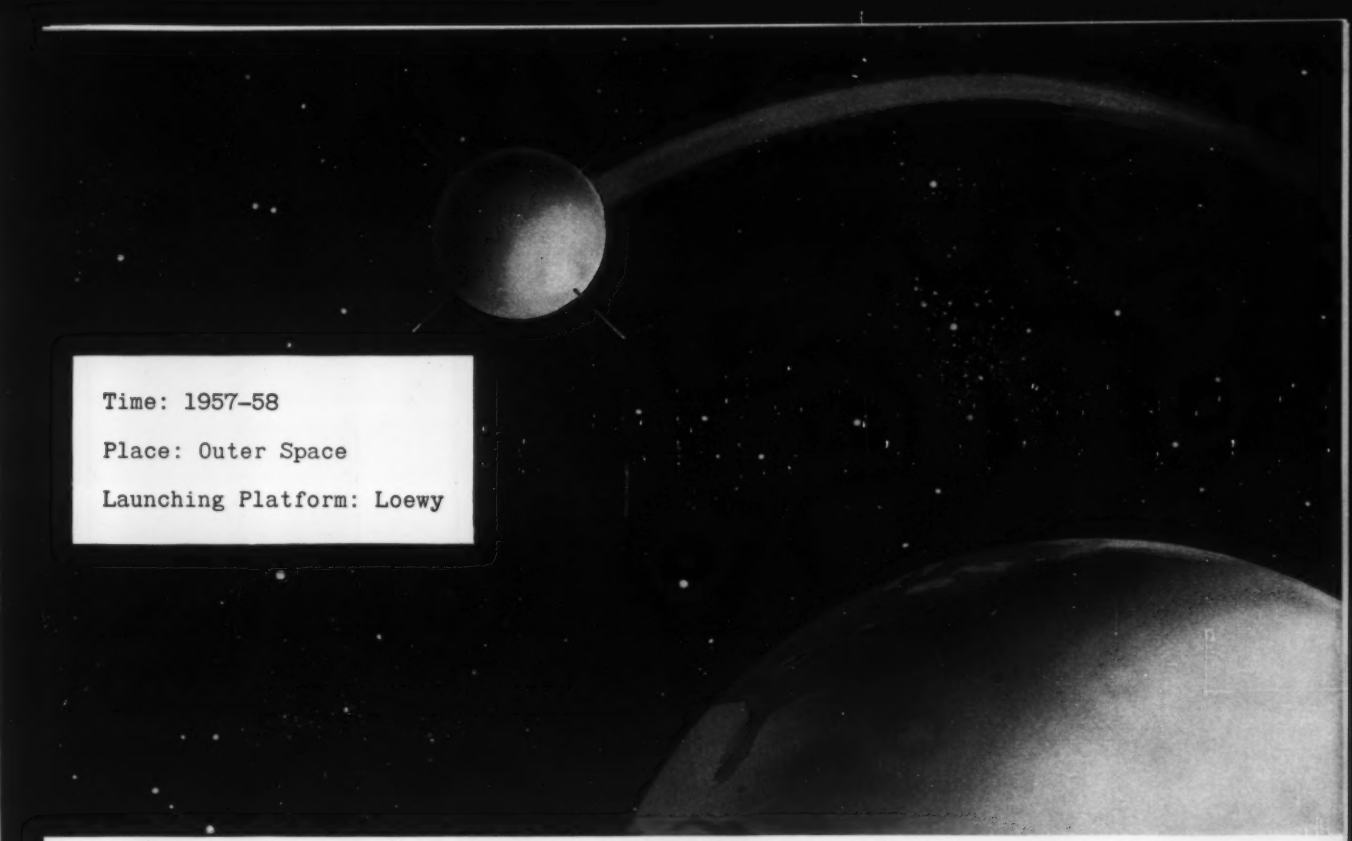
They procrastinate, too, Mr. Trix. They were supposed to send a fleet to Ireland during the Rebellion of '98, and are you aware, sir, that they haven't arrived yet?

Here's How (Hic!)

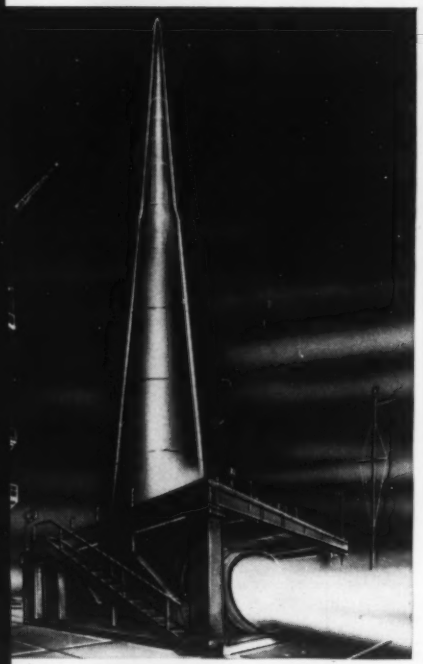
It's too cold today to stir up a difficult puzzle, so let's resurrect the one about antifreeze. If a chummy set of 18 bums can drink 42 cans of canned heat in 16 days, how many bums will drink 28 cans if, in the meantime, one of the bums, Charley, decides that a Sterno can opener can never substitute for the Keys to the Kingdom, and decides to go on the wagon?

Shrdlu

(Metalworking Outlook—Page 53)



AROUND THE WORLD IN 90 MINUTES. Artist's conception of the first man-made satellite, which will circle the earth in 90 minutes as it hurtles through space 300 miles from us at a speed of more than 18,000 miles an hour.



t's conception of Vanguard rocket carrying earth's man-made satellite as it is being launched.

Loewy-Hydropress builds earth satellite launching platform

Under Project Vanguard, the launching structure for the earth's first man-made satellite has been designed, built and installed by Loewy-Hydropress. This platform will be used for both testing and firing the huge 3-stage rocket and will measure its weight and pull during static firings. Loewy-Hydropress, under its subcontract with The Martin Company, Baltimore, prime contractor for the rocket, is in charge of complete stand instrumentation and support stand mechanisms, as well as of utilities and preliminary research, such as heat stress analysis.

The same talents that have successfully met the challenge of Vanguard are solving unprecedented problems in the Fleet Ballistics Missile Program, the Intercontinental Ballistics Program, and other major tactical missile operations. Also making a vital contribution to Project Vanguard is the Electronics and Instrumentation Division of Baldwin-Lima-Hamilton.

Loewy-Hydropress experience in missile launching systems, together with its engineering and complete fabricating facilities, is at your disposal. Take advantage of Loewy's exceptional background and wide range of creative skills. Write us today, Dept. B-2, for full information.

Loewy-Hydropress Division

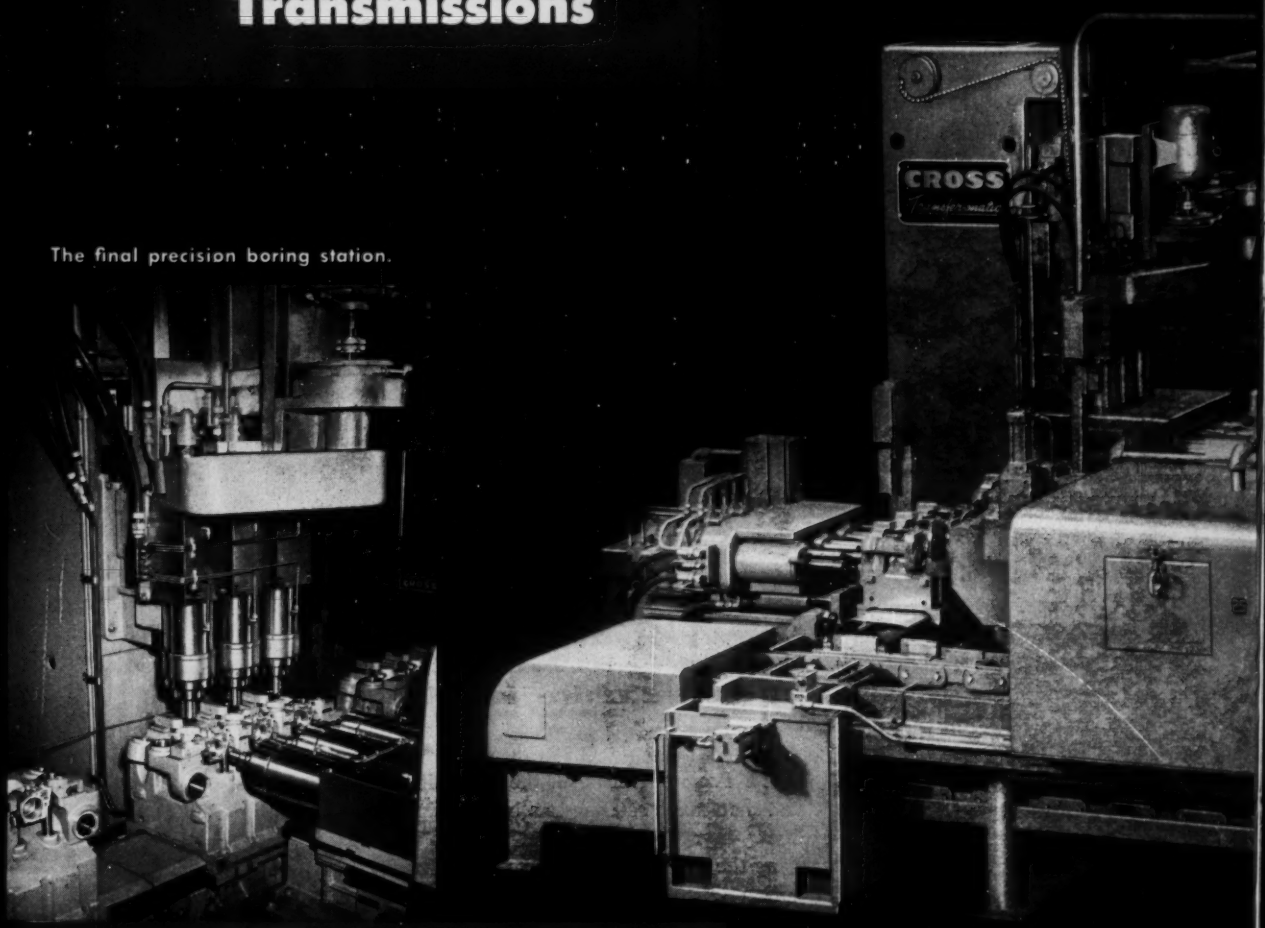
BALDWIN · LIMA · HAMILTON

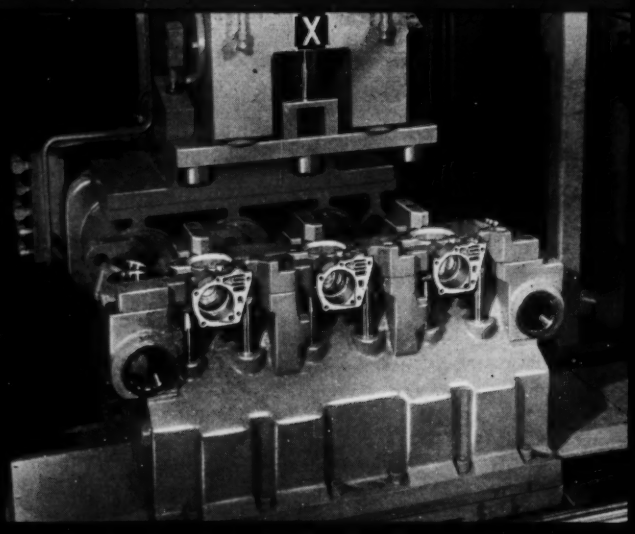
111 FIFTH AVENUE, NEW YORK 3, N.Y. Rolling mills • Hydraulic machinery • Industrial engineering

BALDWIN BLH LIMA-HAMILTON

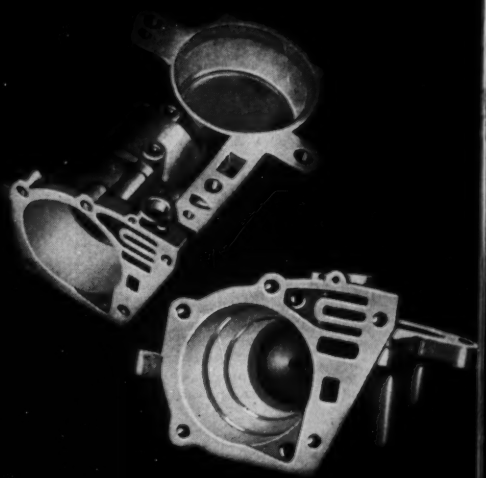
Completely Machines Servo Valve Bodies for Automatic Transmissions

The final precision boring station.

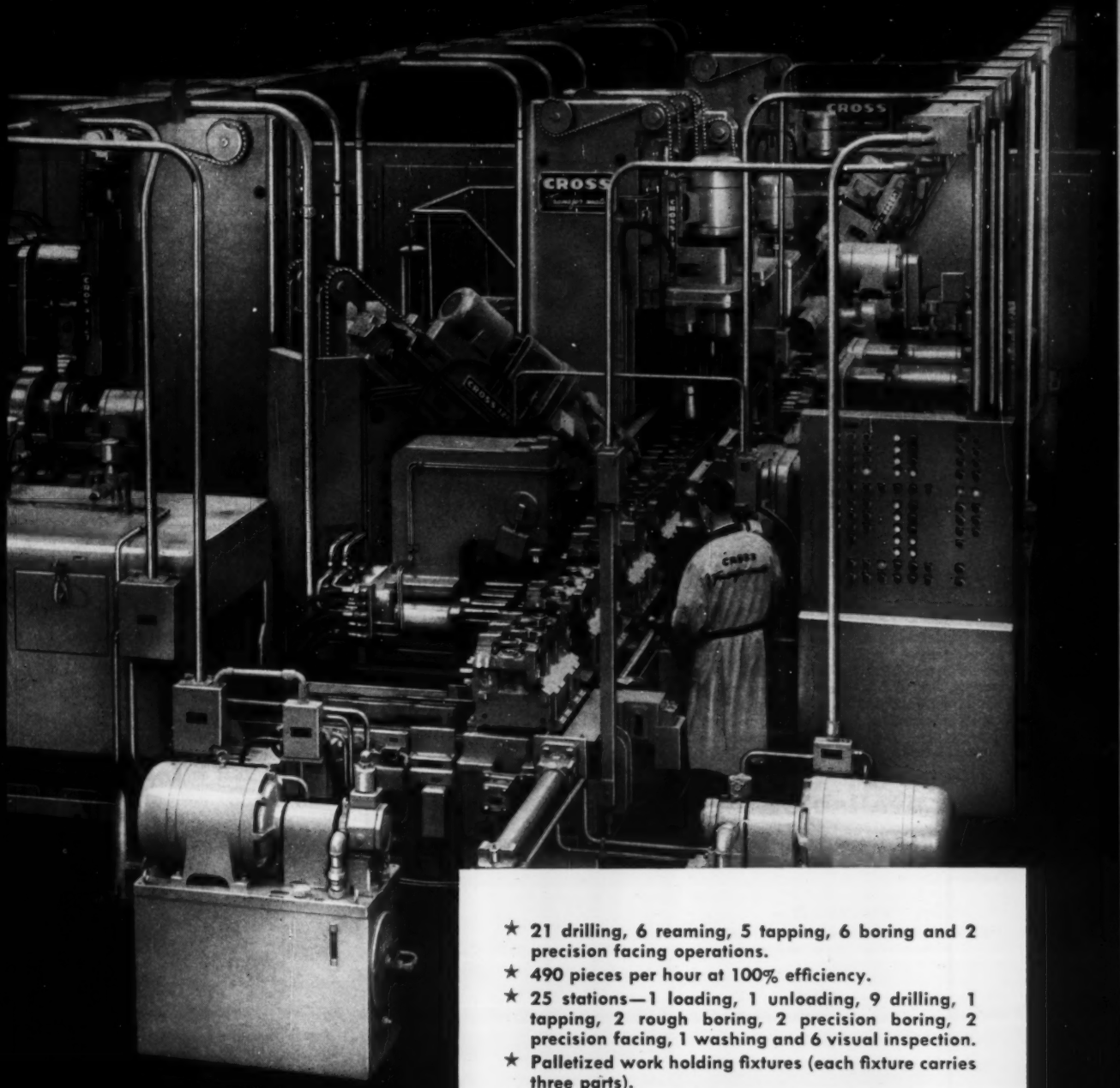




The loading station. Part locations are checked automatically by Unit X to assure proper clamping.



Another Transfer-matic by Cross



- ★ 21 drilling, 6 reaming, 5 tapping, 6 boring and 2 precision facing operations.
- ★ 490 pieces per hour at 100% efficiency.
- ★ 25 stations—1 loading, 1 unloading, 9 drilling, 1 tapping, 2 rough boring, 2 precision boring, 2 precision facing, 1 washing and 6 visual inspection.
- ★ Palletized work holding fixtures (each fixture carries three parts).
- ★ Unloading unit for removing parts from fixtures and placing them on conveyor.
- ★ Complete interchangeability of all standard and special parts for easy maintenance.
- ★ "Building Block" construction to provide flexibility for design changes.
- ★ Other features: automatic washing unit for fixtures; construction to JIC standards; hardened and ground ways; hydraulic feed and rapid traverse for milling, drilling and boring; individual lead screw feed for tapping.

Established 1898

THE CROSS CO.

First in Automation

DETROIT 7, MICHIGAN

Our facilities are open...

to your inquiries about Cannon-Muskegon

VACUUM-MELTED

UltraMet alloys and service

WHATEVER your metallurgical problem, Cannon-Muskegon is equipped and staffed to solve it. Our metallurgists can make the *right vacuum-melted* alloy to fit your need. We can develop and test it in the ultimate in modern research and testing laboratories . . . then produce it to specifications in our modern plant. What's more, Cannon-Muskegon recommends proper handling methods for best results in your application.

In addition, Cannon-Muskegon offers a wide range of ferrous-, nickel- and cobalt-base alloys for your specific needs. These super-clean alloys are poured at pressures from 1 to 10 microns — available in sample or production quantities . . . in cast billets or ingots. Vacuum-melted alloys offer cleaner, smoother surfaces . . . greater tensile strength, ductility and wear life . . . higher electrical and magnetic properties. For complete vacuum-melting service, see Cannon-Muskegon.

Now available are:

- ***Materials for remelt*** — under conventional air melting, inert gas, vacuum.
- ***Casting development*** — includes research and experimental facilities for investment, shell mold, dry sand, and permanent mold castings.
- ***Ingots or cast billets*** — for rolling, forging or extruding in individual weights up to 250 pounds.

ULTRA MET
VACUUM-MELTED ALLOYS
FOR INDUSTRY

For full particulars write for our New Bulletin on Vacuum-Melting and Air-Melting facilities and products.

MODERN RESEARCH facilities and experts are at your service. Constant research with known alloys develops our abilities . . . to your advantage. We are now testing alloys containing boron, aluminum and titanium . . . with interesting results. Send us your problems.

CANNON-MUSKEGON CORPORATION

2893 Lincoln Street Muskegon, Michigan

METALLURGICAL SPECIALISTS

LETTERS
TO THE EDITORS

Lauds Production Ideas Series

Your Production Ideas series is excellent. Please send me ten copies each of Nos. 1 through 7 for distribution in our department and also ten copies of the Program for Management article on brainstorming, "Ideas for Industry" (Apr. 23, page 105).

Dale A. Hawley
Industrial Engineering Department
Wright Aeronautical Division
Curtiss-Wright Corp.
Wood-Ridge, N. J.

Reprint to Russian Embassy

Please send a reprint of the article, "Automation—Bogeyman or Bonanza?" (Oct. 15, page 109).

M. Gribkov
Assistant Comm. Counselor
Embassy of the
Union of Soviet Socialist Republics
Washington

Forum Is Well Done

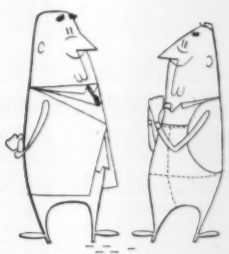
Please have 12 additional copies of your Forum on Technical Progress (Jan. 7, page 217) sent to us. It is exceedingly well done, and I am sure it will be read for months to come.

Walter T. Johnson
Industrial & Scientific Products Division
Curtiss-Wright Corp.
Caldwell, N. J.

I appreciate having had the opportunity of contributing to your fine efforts which have resulted in an excellent year for the Technical Forum.

Geo. A. Tinnerman
President
Geo. A. Tinnerman Corp.
Cleveland

Show Interest in Employee



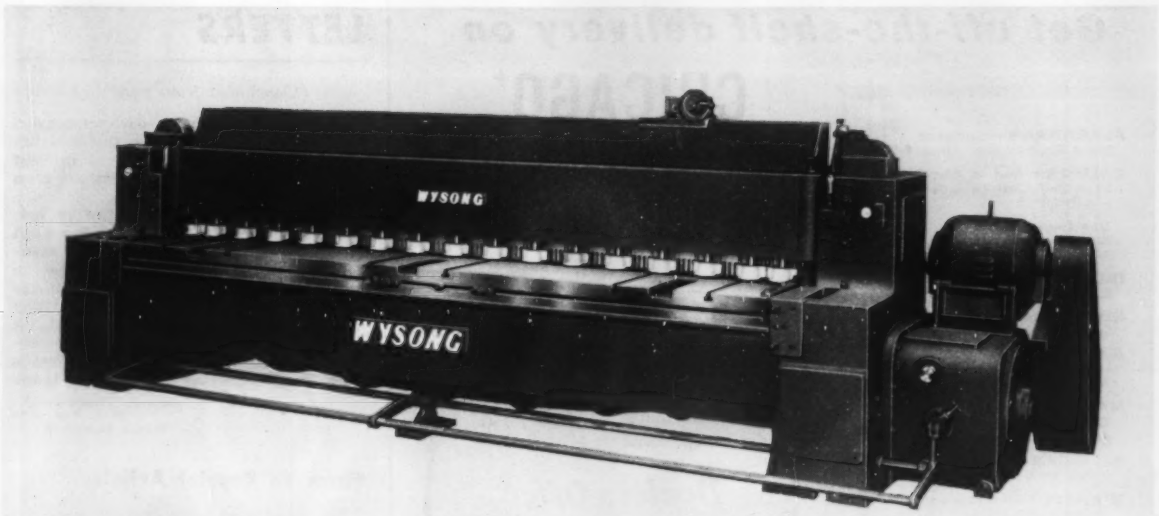
I was interested to read your report, "Get Set for Metalworking's Fabulous Future" (Jan. 7, page 123).

However, in talking about management in the paragraph, "Motivating Men," you stated: They see their workers not as individuals but merely as members of a collective bargaining group.

Immediately following, I think you should have made a strong statement that this is the wrong attitude. For management to deal effectively with its people, it must look on each employee as an individual with individual problems.

Further, management at all levels must be immediately available for consultation, advice and, frequently, just

(Please turn to page 12)



Wysong Squaring Shears are

Wysong No. 1225, capacity ¼" mild steel, cutting length 12 feet.

RUGGED to resist shock and pounding

RIGID to maintain accurate alignment

The primary function of Wysong Shears is to give you maximum production with unsurpassed accuracy — day after day, month after month. Their massive hi-tensile castings assure greater resistance to deflection. Their extra large, accurately machined bearing surfaces prevent twists and binds.

Holddowns provide all the power needed for positive clamping of stock — yet, are easily adjusted to prevent marring soft metals or polished sheets.

Ball-bearing, precision back gauges are designed and built to withstand the impact of volume shearing. Easily adjusted to compensate for eventual wear.

Automatic lubrication is standard on larger models — one-shot lubrication on smaller models.

Safety features include totally enclosed clutch and gears, adjustable stationary finger guards, non-repeat unit and treadle lock.

Simplicity of operation and superior design are keys to low maintenance and low down time.

Power models are available with cutting lengths from 48 inches through 12 feet — capacities from 16 gauge through ⅜" mild steel.

For greater accuracy, larger volume, easier operation and the finest in design — Buy a WYSONG . . . It's MILES Ahead!

Buy A Wysong ... It's Miles Ahead

WYSONG

NATIONAL MACHINE TOOL BUILDERS' ASSN. MEMBER

Wysong and Miles Company
Greensboro, N. C.

Get off-the-shelf delivery on

CHICAGO®
*Induction Hardened**
PRESS BRAKE DIES

ALABAMA—Birmingham
Hinkle Supply Co., Inc.—Phone: 4-4541

CALIFORNIA—Los Angeles
Meyer Sheet Metal Machinery Co.
VAn Dyke 1477

San Francisco
Harron, Rickard & McCone Co.
ATwater 2-2202

INDIANA—Indianapolis
E. L. Humston & Co.—WAlnut 5-9691

IOWA—Bonaparte
Corry's Machine & Tool Co.—Phone: 112

KANSAS—Wichita
Ellfeldt Machinery & Supply Co.
AMherst 7-9773

MASSACHUSETTS—Cambridge
Austin-Hastings Co., Inc. KIrkland 7-4480

MICHIGAN—Detroit
United Saw & Tool Co.—TRinity 2-0246

MINNESOTA—Minneapolis
Minnesota Steel Sup. Co.—ATlantic 6273

MISSOURI—Kansas City
Ellfeldt Machinery & Supply Co.
VIctor 2-5494

NEW YORK—New York
Federal Machinery Co.—CAnal 6-3022
H. Weiss & Co.—CAnal 6-4256

NORTH CAROLINA—Greensboro
Armentrout Mchry. Co.—Phone: 4-8218

OHIO—Cincinnati
Cincinnati Mchry. Co., Inc. TRinity 1-0853

OKLAHOMA—Oklahoma City
Marshall Supply & Equipment Co.
REgent 9-0636

Tulsa
Marshall Supply & Equipment Co.
LUther 4-5275

OREGON—Portland
Pacific Metal Co.—CApitol 7-0693

PENNSYLVANIA—Philadelphia
Milton Equipment Co.—WAlnut 2-1734

TENNESSEE—Nashville
Pearl Equipment Co.—CHapel 2-5476

TEXAS—Dallas
Briggs-Weaver Machinery Co.
LAkeside 8-0311

Fort Worth
Briggs-Weaver Machinery Co.
EDison 6-5621

Houston
Mehl Mchry., Inc.—FAirfax 3-1313
Wessendorff, Nelms & Co.—CApitol 7-8181

WASHINGTON—Seattle
Pacific Metal Co.—MAin 6925

WISCONSIN—Eau Claire
Production Equip. Co.—TEmple 2-3483

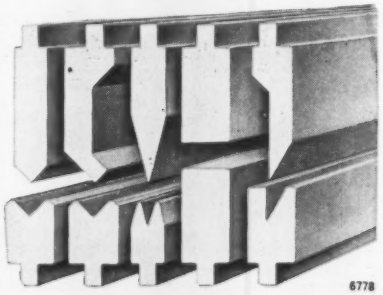
Milwaukee
F. W. Burns Mchry. Co.—FRanklin 4-1540
Production Equip. Co.—GReenfield 6-6075

27
Dealers Offer Stock Deliveries

This country-wide organization of local dealers offers immediate delivery on many CHICAGO *induction hardened* press brake dies. These stock dies are economical, and the quick delivery saves time in tooling. They are available in any length from 4 to 12 feet in increments of 2 feet.

Stock dies are used for a surprisingly large variety of bending operations. And, with CHICAGO *induction hardened* dies you get bonus performance and increased die life at no extra cost. Remember, these dies can be used in any make or size of standard press brake.

On your needs for press brake dies, call your nearest dealer listed here. With Bulletin D-455 you can order by number. Ask for copy.



6778

*Induction hardening is a special, high-frequency process used to harden the wear surfaces of CHICAGO dies. Field reports on CHICAGO *induction hardened* dies show up to ten times longer life than conventional press brake dies.

CHICAGO DREIS & KRUMP

Press Brakes • Straight-Side-Type Presses • Press Brake Dies

Hand and Power Bending Brakes • Special Metal-Forming Machines

DREIS & KRUMP MANUFACTURING CO.

7458 South Loomis Boulevard, Chicago 36, Illinois

LETTERS

(Concluded from page 10)

plain conversation with each employee. Each employee must know this and believe that it stems from real interest in his individual affairs rather than being "company policy."

I firmly believe (this belief is bolstered by recent experiences) that until this change in attitude is made by management the unions will be able to continue to foment the idea that there are two classes of employees—company men and workers—and that the outlook and aims of these two are so unalterably opposed that the workers need a union to protect them and to help them.

John P. Fitzgerald Jr.
P.O. Box 1118
Rocky Mount, N. C.

Firms To Reprint Article

We have read with interest your article, "Cold Heading Branches Out" (Jan. 14, page 71), and would like an extra copy.

As suppliers of cold headed products to the Canadian market, we would like to reproduce the article in quantity for distribution. Will you permit us to do so, provided we give you a credit line?

W. A. Bates
Advertising Manager
Steel Company of Canada Ltd.
Hamilton, Ont.

• *Permission granted.*

We would appreciate two copies of this interesting article. We are also wondering whether we may have your permission to quote from this article, provided credits are given to your publication.

Stanley F. Paulin
Capital Metal Industries Ltd.
Toronto, Ont.

• *Permission granted.*

Perceptive Article

Your Program for Management article, "Industry and College—Partners in Development" (Nov. 12, page 119), seems to me a perceptive and pointed article. It ought to inform many people who need information on the subject.

John A. Pollard
Director of Research
Council for Financial Aid to Education Inc.
New York

Stock Split, Not Sale

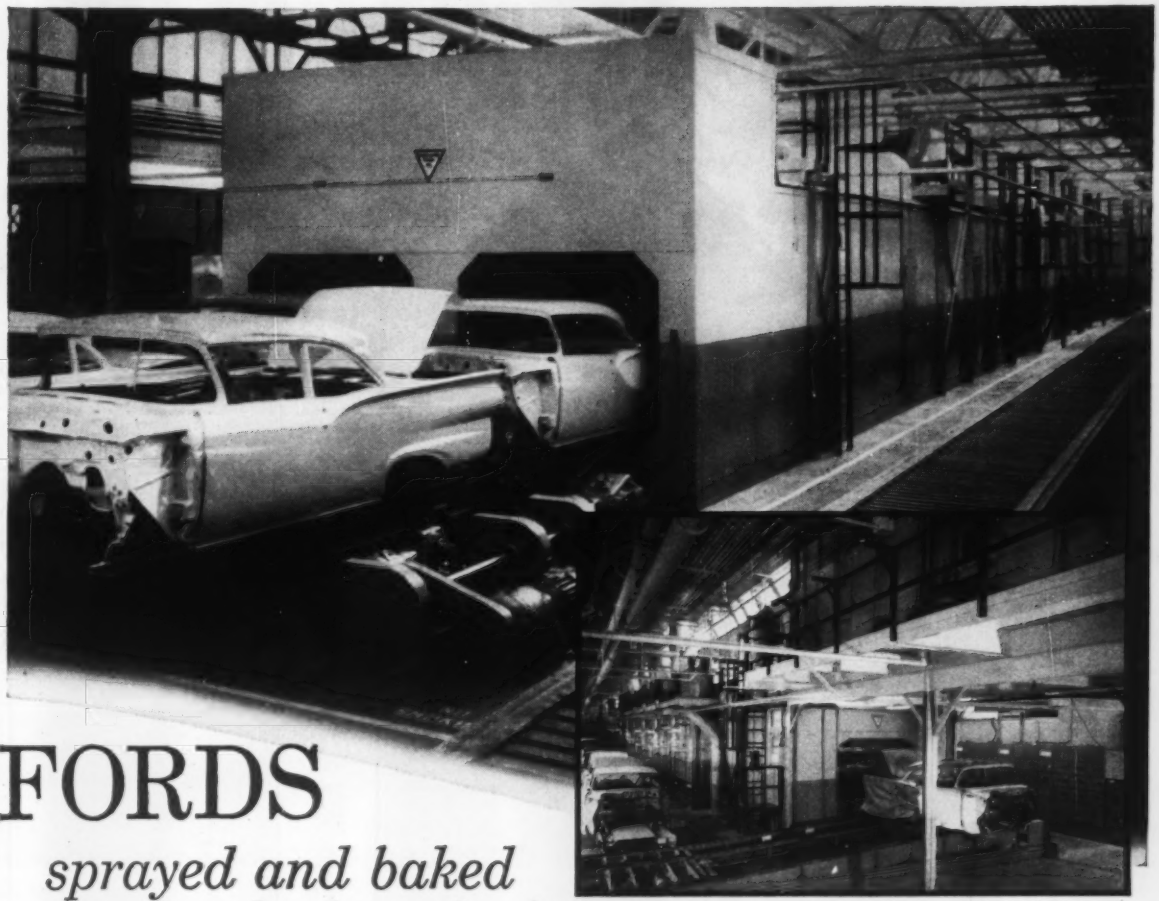
Your article, "Steel Expansions Go Ahead" (Jan. 14, page 37), was most interesting and informative, but may we call your attention to an inaccuracy?

Under the subhead, "Search for Capital," you state: Lukens has authorized a stock split, one purpose of which will be to raise money by stock sales.

The company does not plan to sell stock. Directors authorized only a 3-for-1 split that became effective Jan. 4, 1957, so that each share of the outstanding stock prior to that date then became three shares.

We are pleased always when your editors feel Lukens has done something worthwhile that merits attention in your magazine.

Elliott R. Jones
Manager-Public Relations Division
Lukens Steel Co.
Coatesville, Pa.



FORDS

sprayed and baked to dazzle America!

Talk about Color! The Ford Motor Company is really putting *rainbows on wheels* with this new finishing system built by DESPATCH. Equipment like this enables Ford to produce those rich new 1957 shades . . . faster . . . with superb quality of finish . . . and at the low Ford price.

A wealth of production experience assures the highest standard of performance from DESPATCH equipment. There's a DESPATCH-trained resident engineer near you. Why not talk to him about *your* finishing requirements?

New **DESPATCH** *system speeds solids . . . 2 tones at* **FORD** *Division's Twin Cities Assembly Plant*

This new DESPATCH finishing system enables Ford Motorists to get the colors they want . . . solids or 2 tones . . . and get them *on schedule.* Smaller photo above shows body shells entering block long down draft spray booth. Large photo shows finished units emerging from twin baking ovens. You should see this in color!

Write today for Bulletin 51K

16 colorful pages of suggestions, tips and ideas on modern ways to achieve better finishes, faster production and smoother handling of metal products . . . *at lower cost.*

DESPATCH OVEN COMPANY

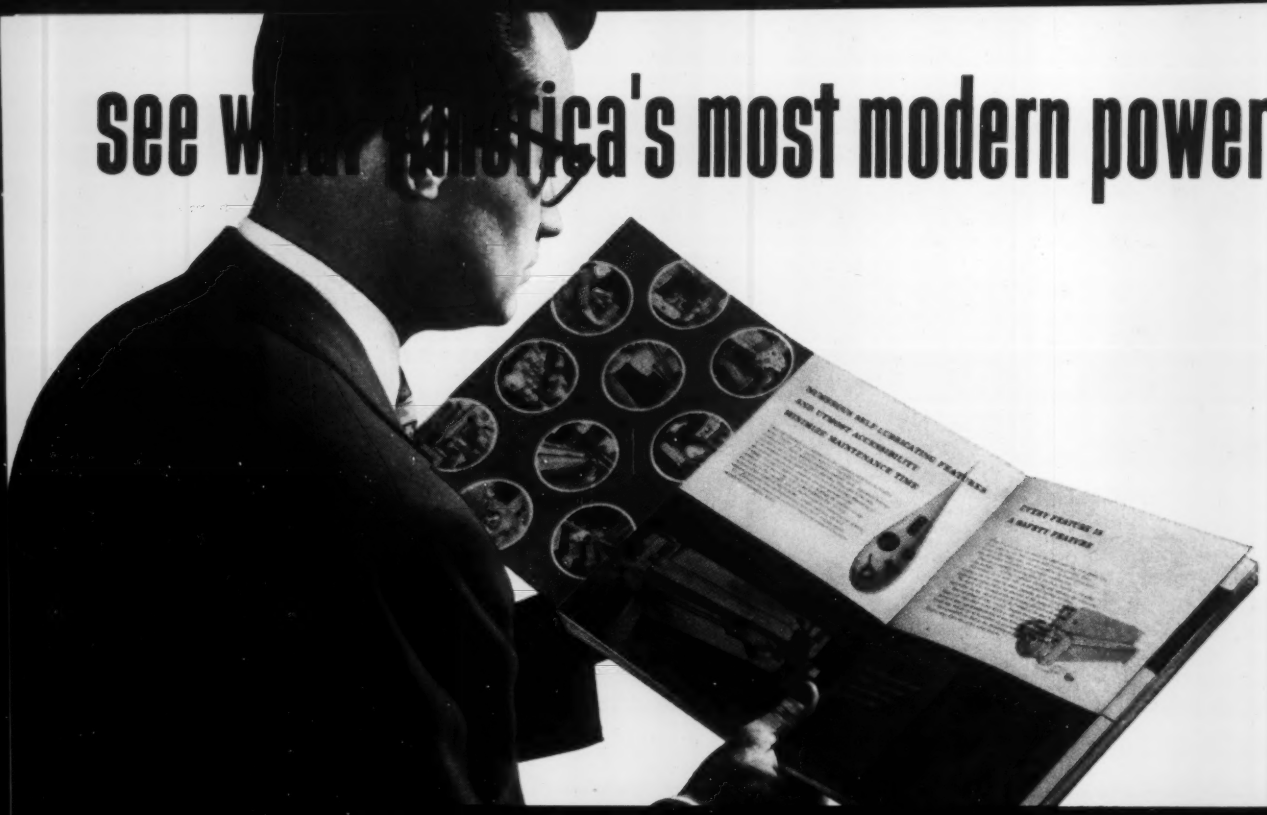
Minneapolis Office—619 S.E. 8th St.

Sales and Service in All Principal Cities

DESPATCH

PIONEERS IN ENGINEERING FINISHING SYSTEMS FOR INDUSTRY

see w[illegible]ica's most modern power

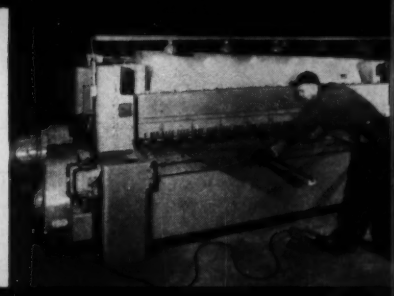


SHEAR USERS EVERYWHERE TELL THEIR STORIES OF NIAGARA BENEFITS

(3 of 19 Photo-Reports shown in Niagara's new Bulletin 69G)

an exceptional machine value"
—World's Largest Trailer Mfr.

"For over 10 years . . . we have never had any downtime for repairs and maintenance."
—V-Belt Pulley and Caster Mfr.



"High quality of accuracy with the utmost in speed and performance"
—Midwest Road Machinery Mfr.

squaring shears can do for you!

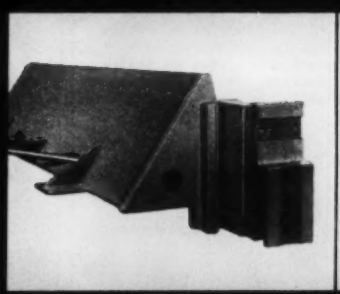
Speed that spells peak productivity! Accuracy for cutting within micrometer tolerances! Ruggedness to stand the gaff on stiffest assignments! They're all yours with a Niagara Power Squaring Shear. New, fact-filled 74-page Bulletin is profusely illustrated to show you how and why:

From mass producers, fabricating plants, steel warehouses and sheet metal shops comes written evidence of the superiority of Niagara Underdrive Squaring Shears on jobs of every description. *No other shear can match Niagara's record for cutting accuracy, speed and downright economy of operation.*

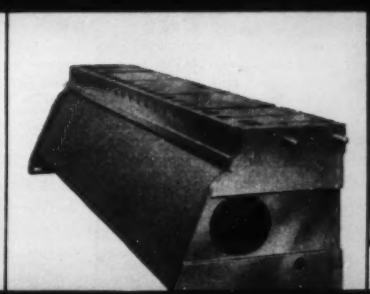
For a photo story of the many tangible ways in which a Niagara Power Squaring Shear can boost hourly output, improve quality and slice maintenance costs in your plant, make sure that you receive Niagara's newly-published Bulletin 69G by mailing the coupon below. Presenting the greatest shear story ever told this 74-page document will give you a close look at Niagara Shears in numerous applications . . . the *closest* look you have ever had at *any* shear, next to having it on your own floor! It will show you feature-by-feature why a Niagara Shear is far ahead at every point of comparison . . . and why it pays to look to America's oldest leading shear manufacturer for the most profitable answers to *your* requirements.

NIAGARA-DEVELOPED FEATURES PROVIDE THE ULTIMATE IN MODERN SHEAR PERFORMANCE

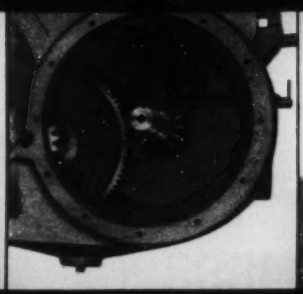
(Here's a glimpse at just a few of many. See them ALL in new Niagara Bulletin 69G)



Fully Closed Box Type Construction



Massive Bed Designed for Super Strength



Instantly Engaging Multi-Jaw Clutch

Powerful, Self-Compensating Holddown

YOURS FOR THE ASKING...

the most comprehensive shear bulletin ever published!

Months in preparation, this fact-filled bulletin now gives you valid, inside facts on the nation's top line of power squaring shears. 74 pages! 141 revealing photographs and illustrations! Specifications for nearly five dozen standard models! Capacities: 16-gage to 1" mild steel. Cutting lengths: 4 to 20 ft. Make sure that you receive a copy at once. Mail the attached coupon today.

NIAGARA MACHINE & TOOL WORKS • BUFFALO 11, N.Y.

MAIL your new Underdrive Squaring Shear Bulletin 69G to us immediately.

NAME _____

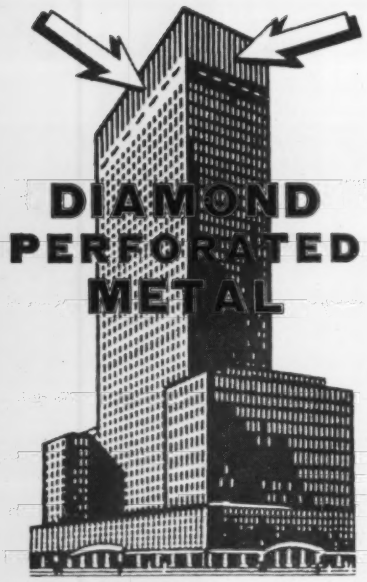
TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

SM

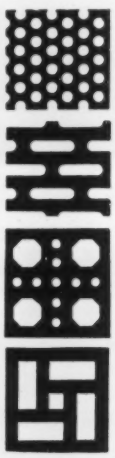


For the top three floors of the beautiful new Socony Mobil office building in New York City, we furnished more than 40,000 sq. ft. of perforated stainless steel wall panels.

from Sky Scrapers to Spin Driers and Juke Boxes

What do YOU require in Perforated Metal?

Already there are thousands of established applications and new requirements are developing every day . . . in such fast growing fields as Air Conditioning, Atomic Energy, Aviation, Chemical Processing, Electronics, Household Appliances, Noise Control, Smoke Abatement, Space Heating, etc.



We produce metal sheets and parts with any desired type or size of perforation and have hundreds of specialized tool arrangements to assure prompt, accurate service at competitive costs. Catalog 39 contains complete working data and shows many interesting applications in its 32 large illustrated pages. Write, today, for a free copy.

DIAMOND MANUFACTURING CO.
Box 32 WYOMING PENNA.

West Coast Plant, Diamond Perforated Metals Co.
17915 So. Figueroa St., Gardena, California
Los Angeles Area

STEEL
The Metalworking Weekly

Editor-in-Chief, IRWIN H. SUCH
Editor, WALTER J. CAMPBELL
Associate Managing Editors, VANCE BELL, JOHN S. MORGAN

WILLIAM M. ROONEY .....Market Editor
ALLEN G. GRAY .....Technical Editor
J. D. KNOX .....Steel Plant Editor
ROBERT F. HUBER .....Machine Tool Editor
HARRY CHANDLER, Copy Editor
FRANK R. BRIGGS .....Associate Editor
ROBERT O. JAYNES .....Associate Editor
VAN CALDWELL .....Associate Editor
JOHN R. BOTZUM .....Associate Editor
AUSTIN E. BRANT .....Assistant Editor
GLENN W. DIETRICH .....Assistant Editor
BYRON E. KENNEL .....Assistant Editor
MARY T. BORGERHOFF .....Assistant Editor
ROSS WHITEHEAD .....Assistant Editor
MARY ALICE EARLY .....Assistant Editor
EILEEN CORTES, Assistant Editor
MARY ANN STUVE .....Editorial Assistant
JANE WEDGE .....Editorial Assistant
BETTY ZAYAC, Editorial Assistant
THOMAS H. BRYAN, TOM WELSH, Art Editors
IRENE KASNER, Editorial Service

Resident Editors

New York 17 .....60 E. 42nd St.
B. K. PRICE, L. E. BROWNE
STANLEY B. STEWART
Murray Hill 2-2581

Chicago 11 .....520 N. Michigan Ave.
ERLE F. ROSS, WILLIAM E. DEAN
Whitehall 4-1234

Pittsburgh 19 .....2837 Koppers Bldg.
ROBERT M. LOVE, Atlantic 1-3211

Detroit 35 .....15800 W. McNichols Rd.
A. DONALD POSTMA
Broadway 3-8150

Washington 4 ....1123 National Press Bldg.
JAMES P. MORRISSEY
Executive 3-6849

London, 2 Caxton St., Westminster S. W. 1
VINCENT DELPORT, European Editor

Editorial Correspondents

Birmingham—Birmingham 3-1121 R. W. KINCEY
Buffalo—Emerson 5385 ....GEORGE E. TOLES
Youngstown—Riverside 7-1471 ..GEO. R. REISS
Los Angeles—Webster 5-3040 NORMAN LYNN
San Francisco—Yukon 6-5151 EDWIN HAVERTY
Seattle—Melrose 1895 .....R. C. HILL
Cincinnati—Beechmont 1-9607....DICK HAVLIN
Toronto, Canada—Empire 4-9655..F. S. TOBIN
Birmingham, England .....J. A. HORTON
Paris, France .....LEON JAUDOIN-PROM
Brussels, Belgium .....PAUL DE KEYSER
Dusseldorf, Germany ....DR. HERBERT GROSS
St. Louis—Jackson 1-9281, HAMILTON THORNTON

BUSINESS STAFF

Advertising Director .....H. G. ROWLAND
Marketing Director ..... D. C. KIEFER
Advertising Service Mgr. ....DORIS MITCHELL
Circ. & Research Dir. ....N. R. LADABOUCHE
Production Manager .....A. V. ANDERSON
Circulation Manager .....G. R. EBERSOLE
Promotion Director .....S. F. MARINO
Reprints .....JUNE SCHILENS
Classified Advertising, EVELYN DIETZ

Advertising Representatives

New York 17 .....60 E. 42nd St.
K. A. ZOLLNER, GUY LABAW
Murray Hill 2-2581

Wynnewood, Pa. (Phila.) 200 Wynnewood Ave.
WM. J. VERSCHOOR—Midway 2-6512

Farmington, Conn. .....12 Farmstead Lane
CALVIN FISHER JR.—Orchard 7-1756

E. Rochester, N. Y. ....217 Ridgeview Dr.
HAROLD A. DENNIS—Browning 2105

Pittsburgh 19 .....2837 Koppers Bldg.
J. C. SULLIVAN—Atlantic 1-3211

Cleveland 13 .....Penton Bldg.
J. K. GILLAM, N. W. MANNING
Main 1-8260

Cincinnati 6 .....2215 Victory Pkwy.
E. L. FRANKE—Parkway 1-0711

Detroit 35 .....15800 W. McNichols Rd.
C. A. TALLINGER JR.—Broadway 3-8150

Chicago 11 .....520 N. Michigan Ave.
L. C. PELOTT, W. L. POLAND
WM. J. D'ALEXANDER
Whitehall 4-1234

Los Angeles 36 .....5943 W. Colgate Ave.
F. J. FULLER—Webster 1-6865

San Francisco 4 .....57 Post St.
Robert W. Walker Co.—Sutter 1-5568

Griffin, Georgia .....1106 Pine Valley Rd.
FRED J. ALLEN—Griffin 7854

BPA

Published Every Monday By
THE PENTON PUBLISHING CO., Penton Bldg., Cleveland 13, O.
MAin 1-8260

GEORGE O. HAYS ..... President
RUSSELL C. JAENKE .....Executive Vice President
FRANK G. STEINEBACH .....Vice President and Secretary
FRANK O. RICE .....Vice President
JOSEPH P. LIPKA .....Treasurer and Assistant Secretary

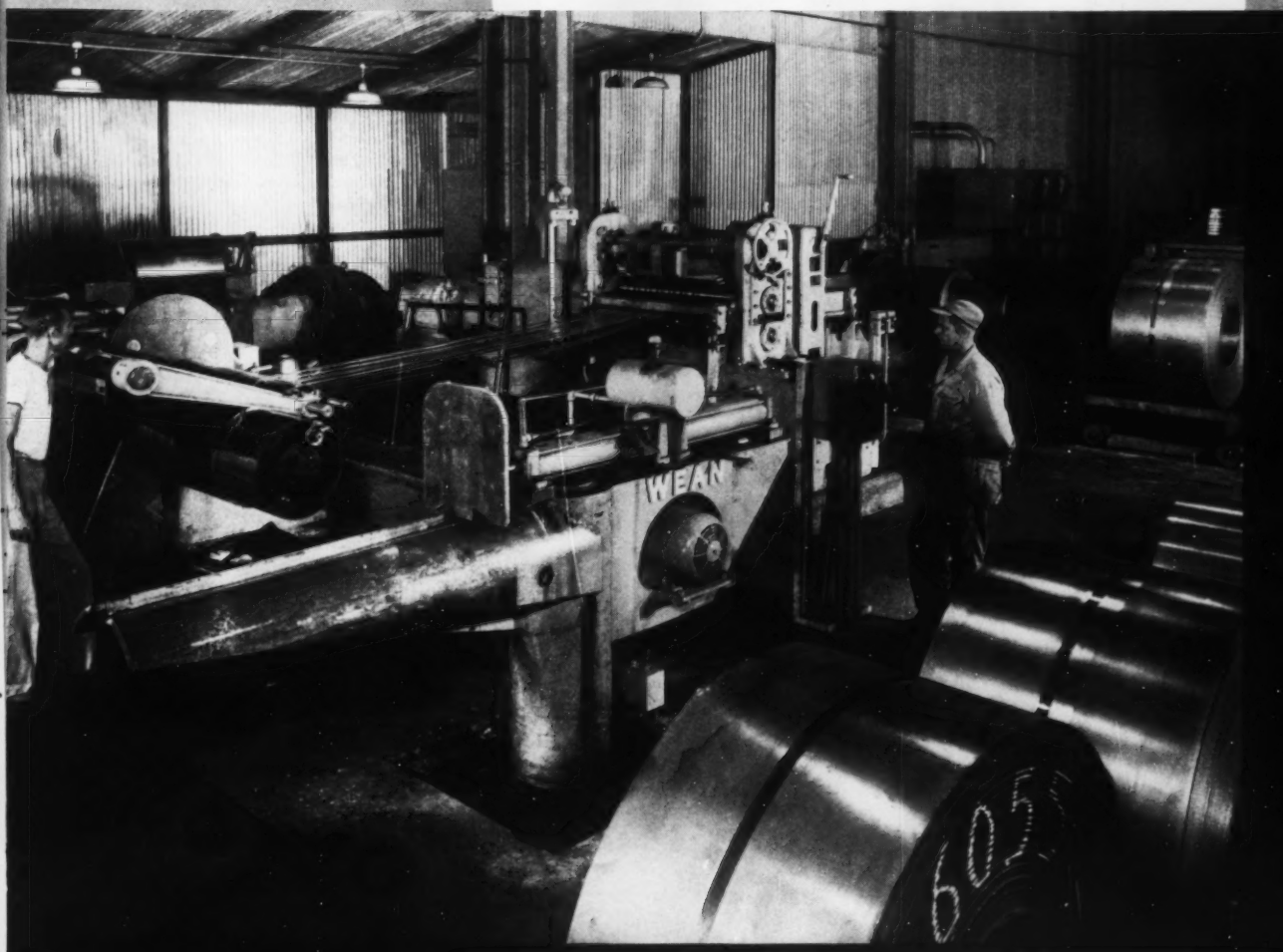
NBP

Also Publisher of
FOUNDRY, MACHINE DESIGN, NEW EQUIPMENT DIGEST, AUTOMATION
Member of Business Publications Audit of Circulation Inc., Society of Business Magazine Editors and National Business Publications Inc.

Slitting is faster, more accurate because of

WEAN

CREATIVE ENGINEERING



160

● Wean high speed slitting lines are being used by more and more of the nation's steelmakers because they are engineered to perform the most accurate slitting job at cost reducing speeds. And, auxiliary coil handling equipment is designed to keep the steel moving — to get maximum production from the line at all times.

If slitting is part of your operation, get the last word on high production slitting from Wean engineers before you buy.

THE WEAN ENGINEERING COMPANY INC., WARREN, O.

the modern bee uses

CF&I-WICKWIRE WIRE!

Modern bees have stopped storing honey in handy hollow trees. Instead, they choose man-made hives—hives which are neatly divided by wood and special round, tinned, hard drawn, low carbon CF&I-Wickwire Bee Wire.

Chances are you don't need wire to make bee hives. But *you may need one or more of the nearly 100 different categories of specialty wire for which CF&I-Wickwire is famous.* Let us show you how we can meet your most rigid chemical and physical specifications on high and low carbon wire in all sizes, shapes, tempers, finishes and grades.

Check This List!

FOR THE WIRE YOU REQUIRE, SEE CF&I-WICKWIRE.

FLAT AND SHAPED WIRES
Armor Wire
Bobby Pin Wire
Bookbinder Wire
Brush Wire
Casing Wire
Cotter Pin Wire
Curtain Spring Wire
Die Spring Wire
Gutter Broom Wire
Lock Spring Steel
Rake Tine Steel
Regulator Spring Wire
Snake Fishing Steel
Stapling Wire for Preformed Staples (Flat)

LOW CARBON FINE AND SPECIALTY WIRE
Bee Wire
Bonnet Wire
Bookbinder Wire
Broom Wire
Clip Wire
Dent Spacer Wire
Drapery Pin Wire
Florist Wire
Fuse Wire
Glass Netting Wire
Hairpin Wire
Hook and Eye Wire
Mattress Wire
Picture Cord Wire
Picker Tooth Wire
Pin Ticket Wire
Pin Wire
Ring Traveller Wire
Spiral Binding Wire
Stapling Wire
Stapling Wire for Preformed Staples
Stone Wire
Weaving Wire
Weaving Wire for Fly Screen Cloth
Wissco Iron Wire

HIGH CARBON FINE AND SPECIALTY WIRE
Aircraft Cord Wire
Armor Wire
Belt Hook Wire
Bobbin Ring Wire
Brush Wire (Tempered and Untempered)
Brush Wire (High Strain)
Chrome Vanadium Spring Wire
Core Wire (Aluminum Cable Steel Reinforced)
Curtain Spring Wire
Flexible Shaft Wire
"Gamma" Spring Wire (Upholstery Spring Wire)
Zig Zag Wire
No-Sag Wire
Hat Wire
Heddle Wire
Hose Reinforcement Wire
Hose Wire, Mechanical
Hose Wire, Vacuum and Defroster
Rope Wire
Signal Corps Wire
Spoke Wire
Hard Drawn Spring Wire
Oil Tempered Wire
Spheroidized or Annealed Spring Wire
Tire Bead Wire
Valve Spring Wire

MANUFACTURERS LOW CARBON COARSE WIRE
Bag Tie Wire
Basket Handle Wire
Box Binding Wire
Brush Handle Wire
"Cal-Tie" Wire
Can Key Wire
Case Hardened Ball Wire
Chain Wire
Clamp Wire
Clothes Pin Wire
Concrete Wall Reinforcement Wire
Garment Hanger Wire
Hay Baling Wire (Coiled)
Lingo Wire
Lintel Wire
Loop Wire
Merchant Quality Wire
Pail Bail Wire
Rivet Wire
Stapling Wire
Strand Wire
Tying Wire
Welding Wire
Wissco Iron Wire
Industrial Quality Wire
Cold Rolling Quality Wire
Heading, Forging or Roll Threading Quality Wire
Medium High Carbon Wire

CF&I-WICKWIRE WIRE

THE COLORADO FUEL AND IRON CORPORATION

THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Casper Denver • El Paso • Ft. Worth • Houston • Kansas City • Lincoln (Neb.) • Oklahoma City • Phoenix Pueblo • Salt Lake City • Wichita • PACIFIC COAST DIVISION—Los Angeles • Oakland • Portland San Francisco • Seattle • Spokane • WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo • Chicago Detroit • New Orleans • New York • Philadelphia • CF&I OFFICES IN CANADA: Montreal • Toronto
CANADIAN REPRESENTATIVES AT: Calgary • Edmonton • Vancouver • Winnipeg

4239

You may not be

Every one of your machine tools is—in truth —a coin-operated machine. Before anything comes out, you have to put in "coin," even though you don't use nickels.

But it might be better if you did! For then you could spot the "one-arm bandits" before their take is revealed (or simply neglected) on your balance sheets or P&L statements.

You could go *right* to the best opportunities for making high-return investments. You could replace the lemons with jackpots.

Ask your production people for their recommendations and when they specify Avey, you can be sure of the results.

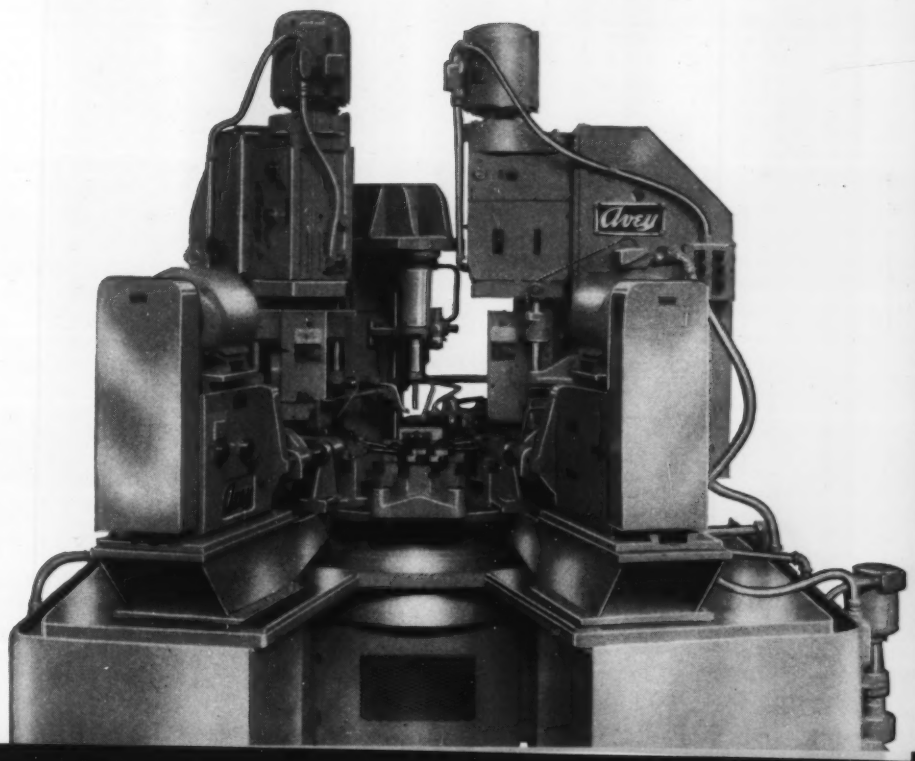
▸ **production data:** This 6-station Avey indexing machine performed drilling, tapping, milling, and broaching operations. Fixtures arranged to handle two different parts. Milling and broaching done in one pass, with cycle time of 8 seconds. Rate: 380 parts/hr. at 100% efficiency.

THE AVEY DRILLING MACHINE CO., CINCINNATI 1, OHIO

drilling, tapping, production machines

in Las Vegas . . .

Avey



ENTHONE *Leads* in SPECIALTY FINISHING PRODUCTS

METAL STRIPPERS

"ALUMON" for Plating on Aluminum

RUST REMOVERS

RUST PROOFING COMPOUNDS

ENAMEL STRIPPERS

METAL BLACKENING COMPOUNDS

Metal Cleaning and Degreasing Compounds

Conversion Coatings for Zinc and Cadmium

STOCK POINTS:
Seattle, San Francisco, Los Angeles, Chicago, Detroit, Dayton, Cleveland, Binghamton, New Haven

WORLD-WIDE DISTRIBUTION
. . . ALSO IN
Canada, Brazil, England, France, Sweden and Germany

Since 1930, ENTHONE Incorporated has developed and brought to the metal finishing market many specialty products and processes. Often these products have provided the answers to finishing problems previously unsolved. ENTHONE ENSTRIPS, for example, are patented products for the selective dissolving of one metal plated on another without attacking the base metal.

ENSTRIP A — U.S. Patent No. 2,649,361 — was the first product ever offered for dissolving nickel plate without attack on the steel basis metal.

ENSTRIP 165-S — U.S. Patent No. 2,698,781 — was the first product ever offered for dissolving nickel from copper base alloys without attack on the basis metal. And there are many other selective strippers in the ENSTRIPS group to meet all requirements.

If you have a metal finishing problem, ask ENTHONE *first!* Write now for the folder "They are HERE . . ." describing **20** ENTHONE answers to difficult finishing problems.

ENTHONE INCORPORATED

442 ELM STREET, NEW HAVEN 11, CONNECTICUT

Metal Finishing Processes • Electroplating Chemicals

CALENDAR
OF MEETINGS

Feb. 4-6, American Management Association: Marketing conference, Hotel Statler, New York. Association's address: 1515 Broadway, New York 36, N.Y. Secretary: Andrew P. Donovan.

Feb. 4-8, American Society for Testing Materials: Committee week, Benjamin Franklin hotel, Philadelphia. Society's address: 1916 Race St., Philadelphia 3, Pa. Executive secretary: Robert J. Painter.

Feb. 5-7, Society of the Plastics Industry Inc.: Reinforced plastics division conference, Edgewater Beach hotel, Chicago. Society's address: 250 Park Ave., New York 17, N.Y. Executive vice president: William T. Cruse.

Feb. 7-8, American Management Association: Special conference on nucleonics in industry, Hotel Statler, New York. Association's address: 1515 Broadway, New York 36, N.Y. Secretary: Andrew P. Donovan.

Feb. 7-8, Malleable Founders' Society: Technical and operating conference, Wade Park Manor, Cleveland. Society's address: 1800 Union Commerce Bldg., Cleveland 14, O. Executive vice president: Lowell D. Ryan.

Feb. 11-13, Drop Forging Association: Winter meeting and exhibit, Edgewater Beach hotel, Chicago. Association's address: 419 S. Walnut St., Lansing 33, Mich. Secretary-treasurer: Richard Marcus.

Feb. 13-15, American Management Association: Mid-winter, personnel conference, Palmer House, Chicago. Association's address: 1515 Broadway, New York 36, N.Y. Secretary: Andrew P. Donovan.

Feb. 14-15, Eastern States Blast Furnace & Coke Oven Association: Annual winter meeting, Penn-Sheraton hotel, Pittsburgh. Information: C. L. Potter, Jones & Laughlin Steel Corp., 3 Gateway Center, Pittsburgh 20, Pa.

Feb. 24-28, American Institute of Mining, Metallurgical & Petroleum Engineers: Annual meeting, Roosevelt and Jung hotels, New Orleans. Institute's address: 29 W. 39th St., New York 18, N.Y. Secretary: E. O. Kirkendall.

Feb. 25-27, American Management Association: Annual special conference on electronics, Hotel Statler, New York. Association's address: 1515 Broadway, New York 36, N.Y. Secretary: Andrew P. Donovan.

Feb. 25-Mar. 1, International Heating & Air-Conditioning Exposition: International Amphitheatre, Chicago. Information: International Exposition Co., 480 Lexington Ave., New York 17, N.Y. President: E. K. Stevens.

Mar. 5-7, American Machine Tool Distributors Association: Spring meeting, El Mirador hotel, Palm Springs, Calif. Association's address: 1900 Arch St., Philadelphia 3, Pa. General manager: James C. Kelley.

Mar. 5-7, Society of Automotive Engineers Inc.: National passenger car, body and materials meeting, Sheraton-Cadillac hotel, Detroit. Society's address: 485 Lexington Ave., New York 17, N.Y. Secretary: John A. C. Warner.

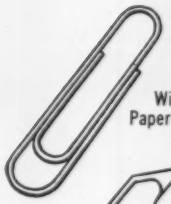
Mar. 6-8, Pressed Metal Institute: Annual spring technical meeting, Carter hotel, Cleveland. Institute's address: 3673 Lee Rd., Cleveland 20, O. Managing director: H. A. Daschner.

Mar. 10-13, National Association of Waste Material Dealers Inc.: Annual convention, Conrad Hilton hotel, Chicago. Association's address: 271 Madison Ave., New York 16, N.Y. Managing director: Clinton M. White.

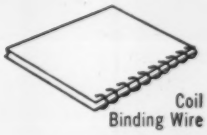
Mar. 11-15, 1957 Nuclear Congress: Convention Hall, Philadelphia. Co-ordinator: Engineers Joint Council, 29 W. 39th St., New York 18, N.Y.

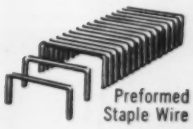
Mar. 13-15, National Fluid Power Association: Annual meeting, Hollywood Beach hotel, Hollywood, Fla. Association's address: 1618 Orrington Ave., Evanston, Ill. Executive secretary: Barrett Rogers.

Whatever your problem is in **Wire...**


Wire for Paper Clips

Piano Covering Wire


Coil Binding Wire


Preformed Staple Wire

Wire for Milk Bottle Carriers

Florist Wire

Wire Bales for Buckets, Pails, etc.

Wire for Toy Wheels

Standard and Special Wire Shapes

Thousands of wire applications in over a half century—involving virtually every kind of a wire problem—that's the experience and background we offer you in solving *your* special wire problems. We can supply wire from almost the size of a human hair, through 9/16" diameter for metal fasteners . . . round wire or wire in special shapes, practically any size, temper, finish and analysis in low carbon and medium low carbon steels. We may have a valuable case history that parallels your own special problem. Fill out and return the coupon for full details of Continental's Wire Service. We are eager to work with you.

Fill out and mail today

Gentlemen: Please give us without obligation complete details of your special wire service.

NAME_____ TITLE_____

FIRM_____

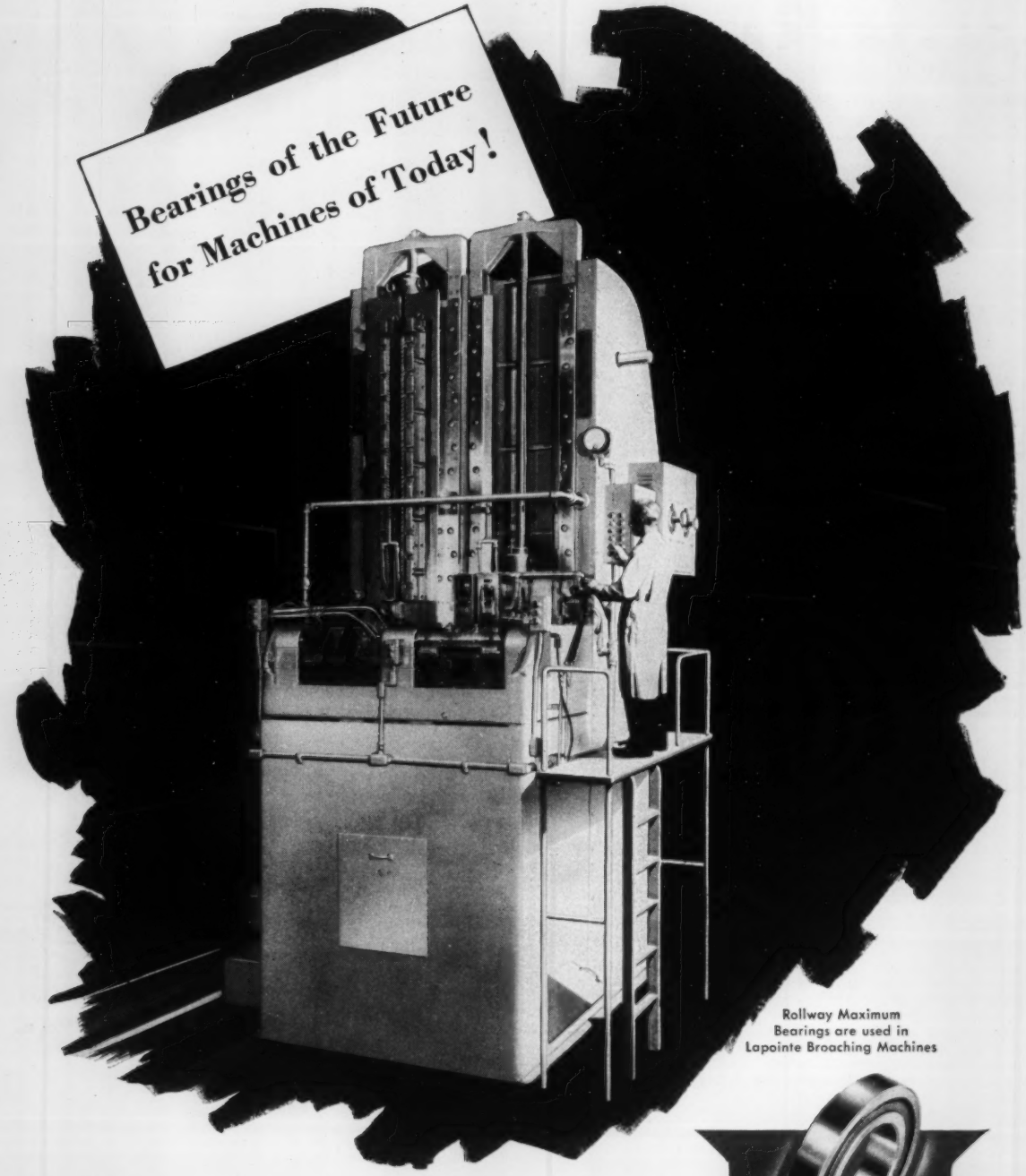
ADDRESS_____

CITY_____ STATE_____

CONTINENTAL
STEEL CORPORATION • KOKOMO, INDIANA

PRODUCERS OF: Manufacturers' Wire in many sizes shapes, tempers, and finishes, including Galvanized, KOKOTE, Flame-Sealed, Coppered, Tinned, Annealed, Liquor Finished, Bright, and special wire. ALSO Nails, Continental Chain Link Fence, and other products.

Bearings of the Future for Machines of Today!



Rollway Maximum Bearings are used in Lapointe Broaching Machines

Rollway roller bearings regularly offer performance capabilities for more than the needs of today. They are continuously anticipating the operating requirements of years ahead.

Wherever bearing precision and load values are important in your plant or products — for original equipment or replacement service — call on Rollway *bearings of the future,* to give you the utmost performance in your machines of today. Rollway Bearing Company, Inc., Syracuse 4, N. Y. Manufacturers of a complete line of radial and thrust cylindrical roller bearings.

ROLLWAY
Maximum
ROLLER BEARINGS

ENGINEERING OFFICES: Syracuse · Boston · Chicago · Detroit · Toronto · Pittsburgh · Cleveland · Milwaukee · Seattle · Houston · Philadelphia · Los Angeles · San Francisco

THERE'S A
COMPLETE LINE OF ROEBLING

Galvanized

ROEBLING is a specialist in galvanizing, with practically unmatched facilities for producing galvanized wire in enormous quantities and in complete size ranges. Hot galvanized is available in sizes from .283″ to .035″... Roegal (drawn galvanized) from .187″ to .005″.

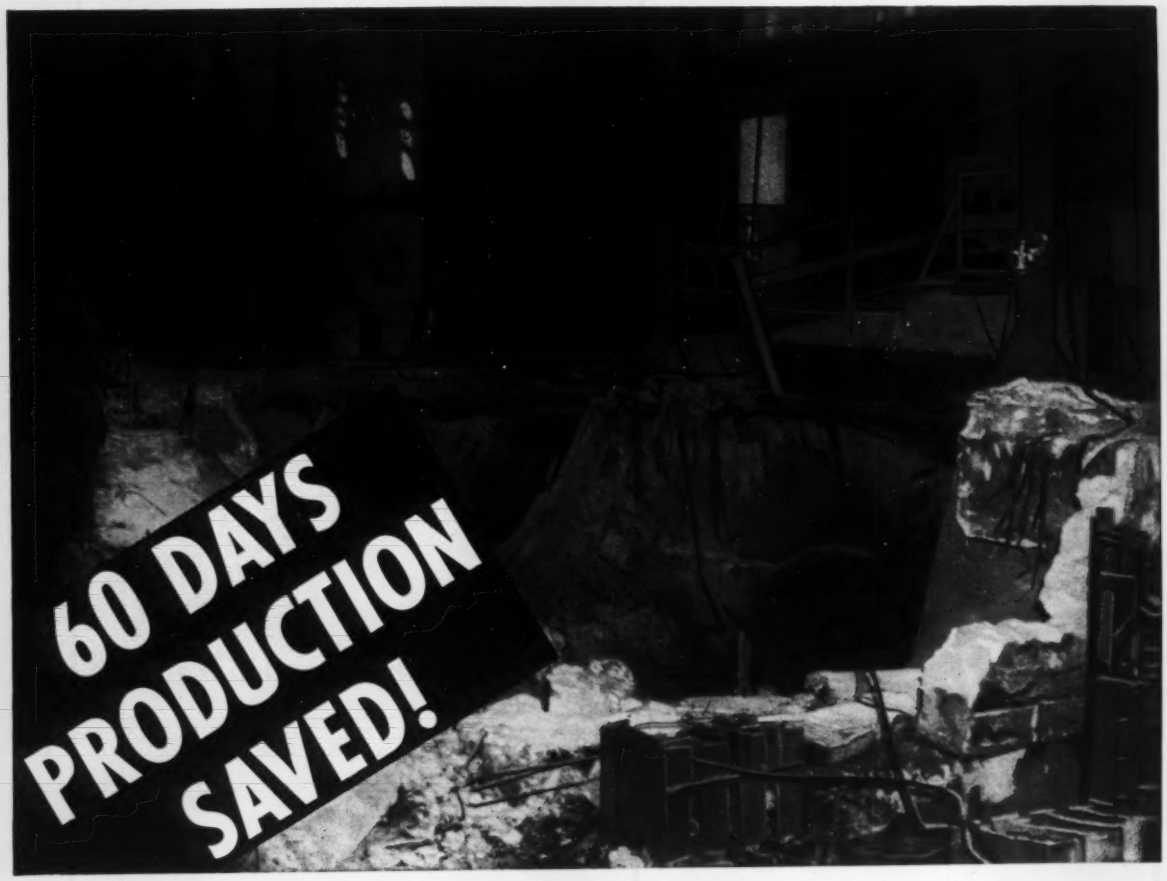
And Roebling galvanized wire can be packaged in the way most convenient and economical for you... in coil diameters of 60″, 30″, 22″, 16″ and 8″...on reels, spools or handy spoolless cores.

You *pay* for the best when you buy galvanized wire. Make sure you *get* it—specify Roebling! John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

ROEBLING CF&I

Subsidiary of The Colorado Fuel and Iron Corporation

ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. & 5 PITTSBURGH ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 2340 GLENDALE-MILFORD RD., EVENDALE • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • ROCHESTER, 1 FLINT ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • ST. LOUIS, 3001 DELMAR BLVD. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, 19 RECTOR ST., NEW YORK 6, N. Y.



" . . . and this was accomplished without disrupting other work going on in area . . . and, more important, without an accident!"

Early last year, management of a large steel plant decided that its 90" Blooming Mill had to be replaced. Production requirements demanded that the down-time for making the extensive changes . . . including a complete tear-out of the old foundation . . . had to be held to a minimum.

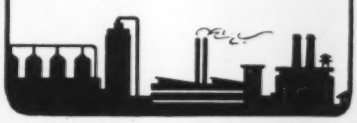
It was at this point that CHICAGO CONCRETE BREAKING COMPANY was called in for consultation. Realizing the vital importance of every hour to the plant, CHICAGO CONCRETE'S skilled blasting experts used a three-dimensional model of the foundations to lay out the drilling pattern. As a result of this careful planning, 95% of the drilling was accomplished PRIOR TO SHUT-DOWN OF THE MILL AND WITHOUT ANY INTERFERENCE WITH PRODUCTION.

Thus, blasting was performed simultaneously with the removal of the mill. Using modern methods, developed over 35 years of experience, CHICAGO CONCRETE was able to control-blast and remove 5,200 cubic yards of concrete and slag SOME 60 DAYS AHEAD OF THE TIME NORMALLY TAKEN BY OLD-FASHIONED METHODS. Needless to say, reconstruction was able to begin well ahead of schedule.

With careful planning, intelligent preliminary work, and skill . . . born of experience and developed over three decades . . . the job was completed in minimum time, ahead of schedule, and without an accident. This is but another example of the service available to you by CHICAGO CONCRETE BREAKING COMPANY . . .

AND NOW

CHICAGO CONCRETE CONSTRUCTION COMPANY offers a complete industrial construction service . . . handling anything from minor masonry, steel or foundation repairs to complete furnace rebuilds.



CHICAGO CONCRETE BREAKING CO.

EDWARD GRAY, PRESIDENT

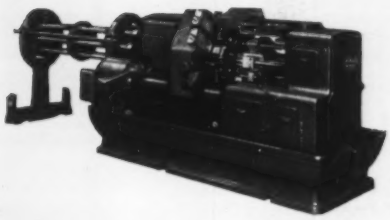
12233 S. AVENUE "O", Chicago 33, Ill., BAyport 1-8400 **PITTSBURGH AREA - 213 Corey Ave., Braddock, Pa., Electric 1-1656**

SERVING THE PRIMARY METALS AND OIL INDUSTRIES WITH KNOW HOW, EQUIPMENT AND MANPOWER FOR 35 YEARS

FROM DIESEL ENGINE TO ICE-CREAM FREEZER PARTS

AUTOMATIC BAR MACHINES

Handle All Types of Jobs



SIX AND FOUR-SPINDLE AUTOMATIC BAR MACHINES

GREENLEE Special Machine Tools

- Multiple-Spindle Drilling and Tapping Machines
- Transfer-Type Processing Machines
- Hydro-Borer Precision Boring Machines

✓ Efficiently...
✓ Economically

Greenlee design permits the handling of a wide variety of operations at various spindle positions ... makes it easier to split up long operations ... reduces idling time.

Threading, tapping and reaming can be performed in 3rd, 4th, 5th and 6th positions ... a special Greenlee advantage. Seven full-length T-slots on the main tool slide will accommodate the tools and attachments needed for a wide range of set-ups. Interchangeable cross-slide tooling and simplified cross-slide camming contribute to greater flexibility and faster set-ups.

Investigate! Ask any owner or operator ... they'll tell you that Greenlee is one of the most highly respected names in its field.

Write for Catalog No. A-405

GREENLEE BROS. & CO.

1922 MASON AVE.
ROCKFORD, ILL.

Quantity
PRODUCTION
of
GREY IRON CASTINGS

ONE OF THE NATION'S
LARGEST AND MOST MODERN
PRODUCTION FOUNDRIES

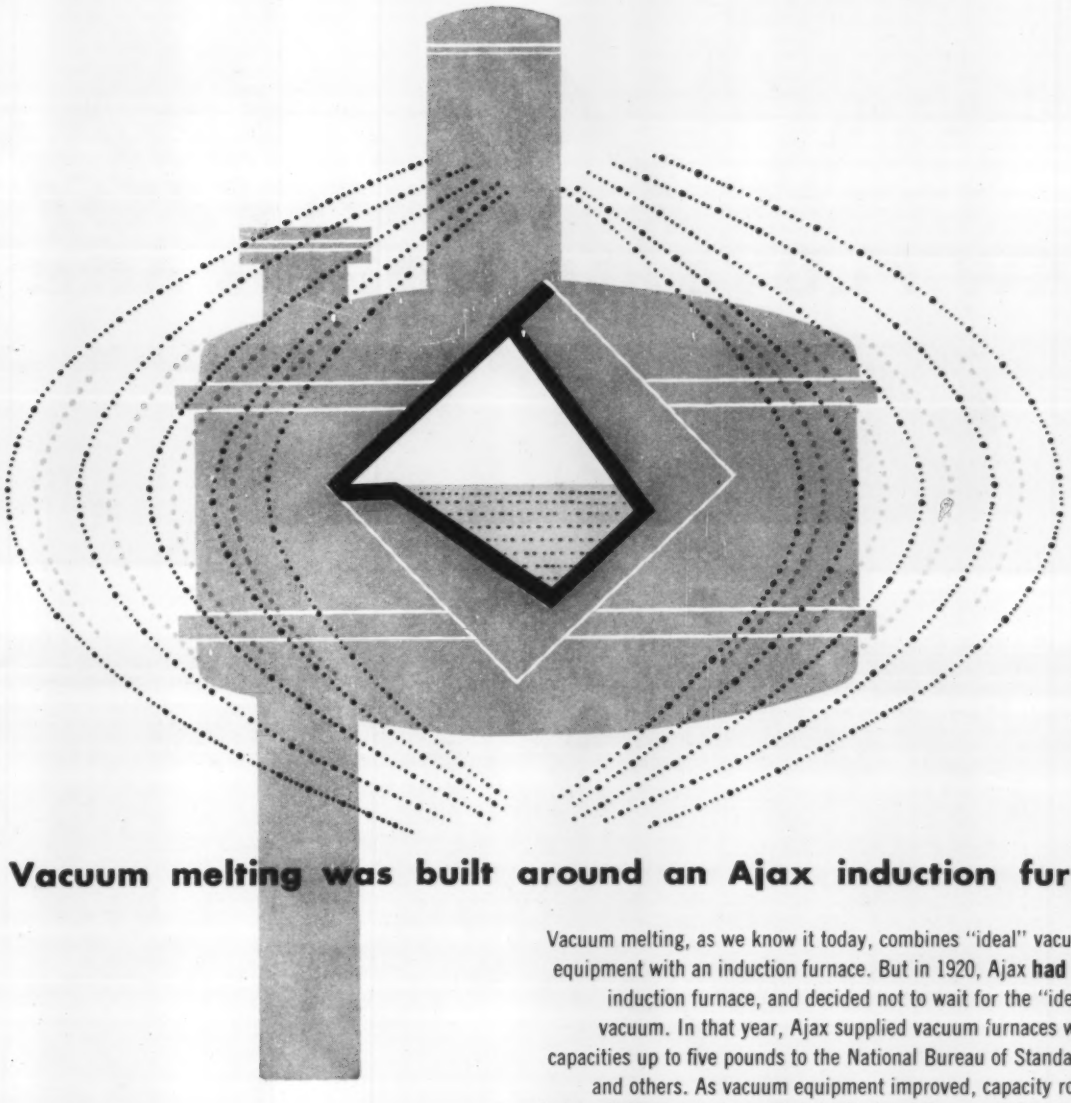
ESTABLISHED 1866

THE WHELAND COMPANY

FOUNDRY DIVISION

MAIN OFFICE AND MANUFACTURING PLANTS

CHATTANOOGA 2, TENNESSEE



Vacuum melting was built around an Ajax induction furnace

Vacuum melting, as we know it today, combines "ideal" vacuum equipment with an induction furnace. But in 1920, Ajax **had** the induction furnace, and decided not to wait for the "ideal" vacuum. In that year, Ajax supplied vacuum furnaces with capacities up to five pounds to the National Bureau of Standards and others. As vacuum equipment improved, capacity rose. And by 1941 Ajax had supplied the National Bureau of Standards and several manufacturers with 100 lb. capacity vacuum furnaces. Further strides in vacuum technology made it feasible in 1946 for Ajax to supply the United States Government with 500 lb. capacity furnaces for atomic work . . . and to this date it continues to supply these and larger furnaces for the same kind of work. Today, vacuum equipment is closing the gap. But it is significant that of all the vacuum melting installations of the past ten years, the majority have been built around Ajax-Northrup induction furnaces and controls.

The fascinating history of induction heating and its unique application to melting, forging, and heating operations throughout industry are told in a new book. Write Ajax Electrothermic Corporation, Trenton 5, New Jersey, for your copy.

Induction heating melting

AJAX

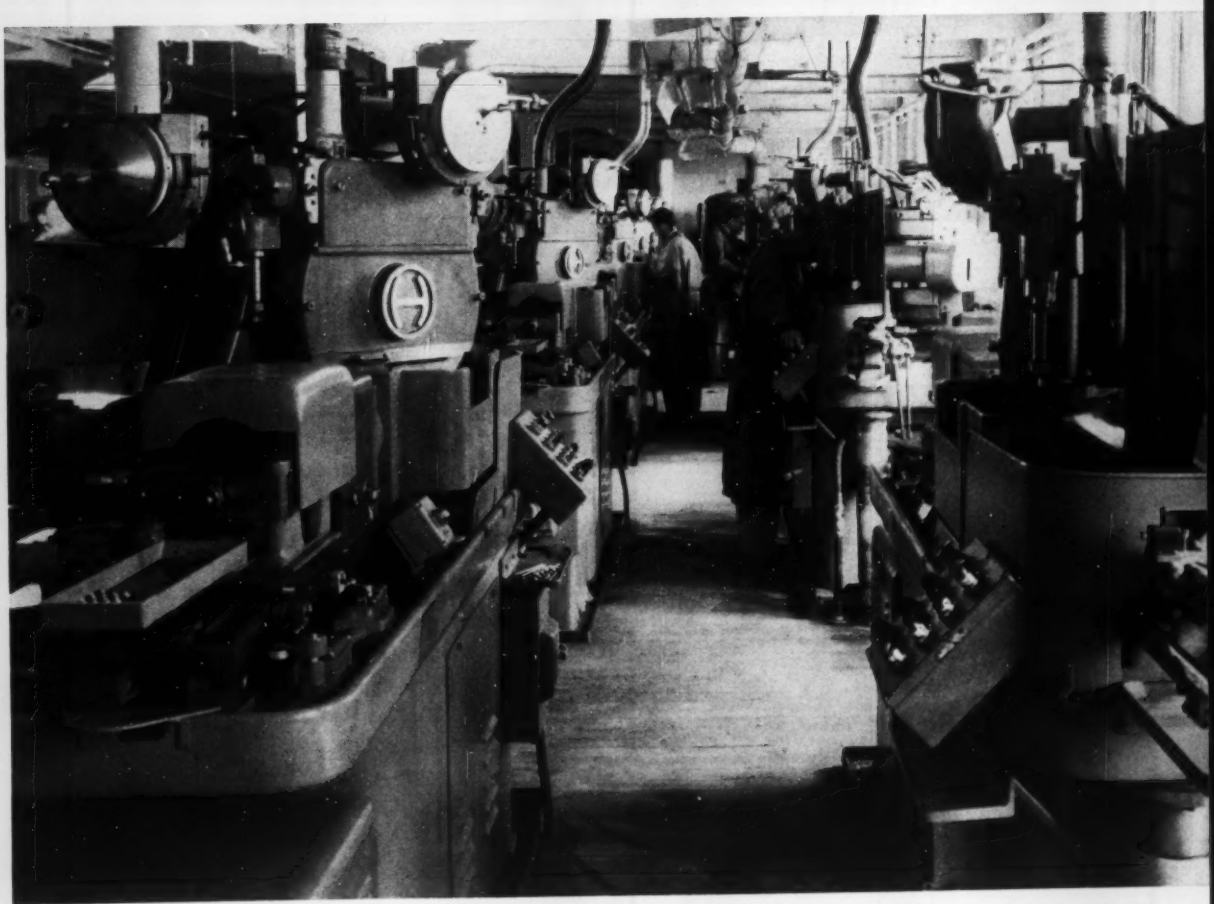
NORTHRUP

Vacuum metallurgy is just one of the many industries which owe their existence to Ajax-Northrup induction heating.

ASSOCIATED COMPANIES: AJAX ELECTRIC COMPANY—AJAX ENGINEERING CORPORATION

Another

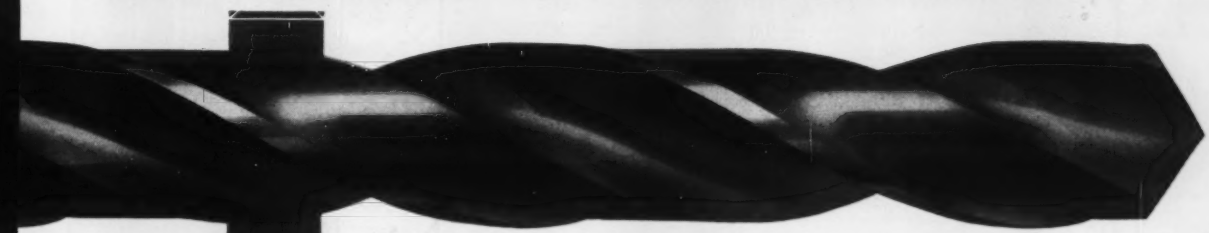
NEW FLUTE GRINDERS ARE

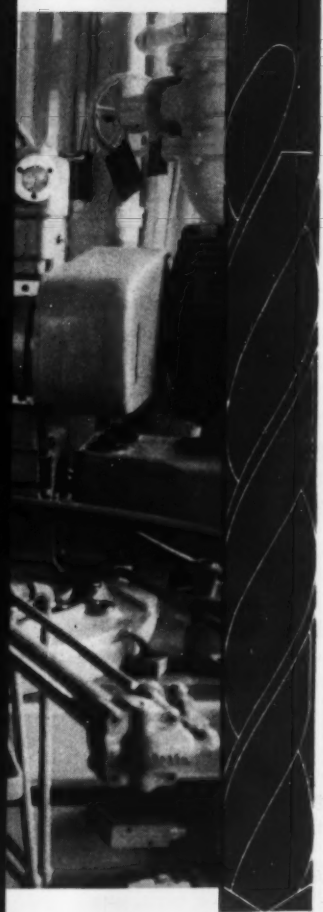


Still another Reason why

Morse First

THE FIRST OF THEIR KIND...





Now grinding from the solid up to 1/2 inch

And, here's what it means to you:

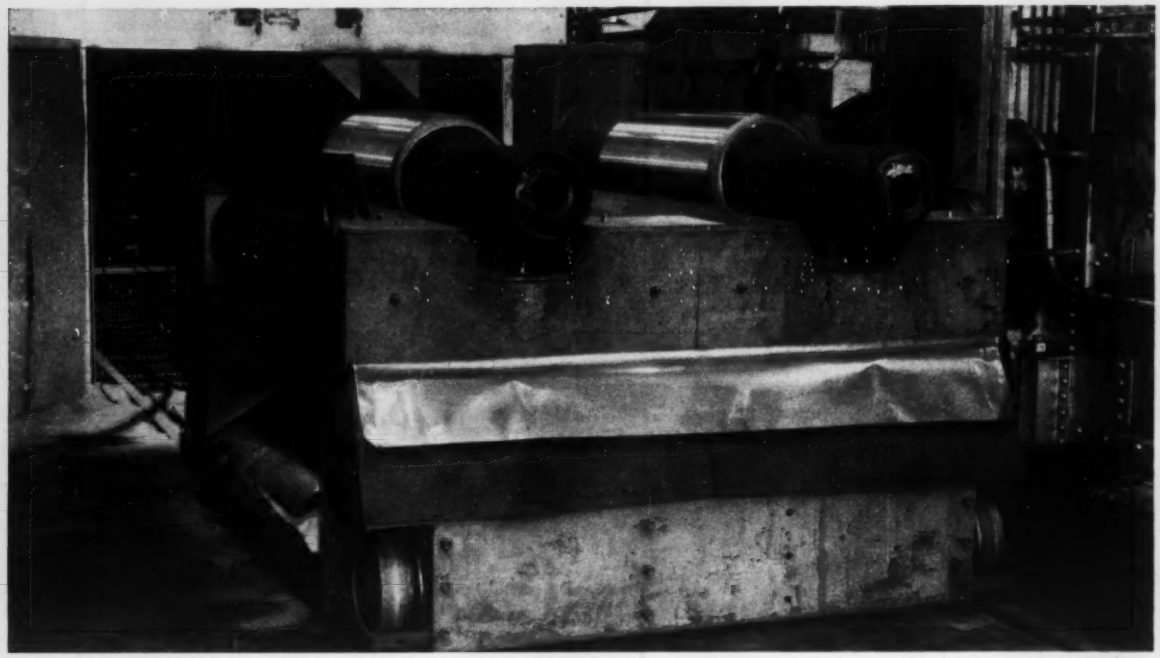
- ★ Smoother finish . . . better than polished flutes!
- ★ Consistently held tolerances . . . never attained by milling!
- ★ Better points . . . because of uniform flute depth!
- ★ Longer tool life . . . lower cost per hole!

This is why the new Morse flute ground drills are setting a new standard for quality . . . and, the only man who can show you is your Morse-Franchised Distributor.

MORSE TWIST DRILL & MACHINE COMPANY
New Bedford, Massachusetts
Subsidiary of VAN NORMAN INDUSTRIES, INC.
Warehouses in New York, Chicago, Detroit, Dallas, San Francisco

MORSE *means* "THE MOST" *in Cutting Tools*

Which advantage is most important to you?



You get them all in WHEELABRATOR® mechanical mill roll etching

? Uniform etch

? Longer roll life

? Better product finish

? Time savings

? Cost reductions

The mechanical and automatic nature of Wheelabrator mill roll etching brings you all of these advantages. For instance, it eliminates the opportunity for human error. Once calibrated, it automatically produces a uniform etch, with optimum penetration, roll after roll. This also means longer roll life — as much as 30% more service life. There are no areas of shallow etch to cause too-frequent dressing and no areas of too-deep etch to cause waste of roll surface in successive etchings. This uniformity also provides more uniform surface finishes on the final product.

Variety in type and size of abrasive, velocity and volume of abrasive, speed of work travel and rotation and other variables are easily adjusted to provide close control of the surface etch. This means a single machine can produce a wide variety of finishes, each meeting a precise surface roughness specification. Time and cost savings come from speed of etching, which recently has been improved by a work car that carries two rolls at once. This not only saves etching time but also reduces mill delay. In addition, changeover for different finishes is faster and re-roll tonnage is reduced because a flatter strip is produced under increased screw-down pressures.

Why not get all of these advantages in your plant for swift, sure mill roll etching?

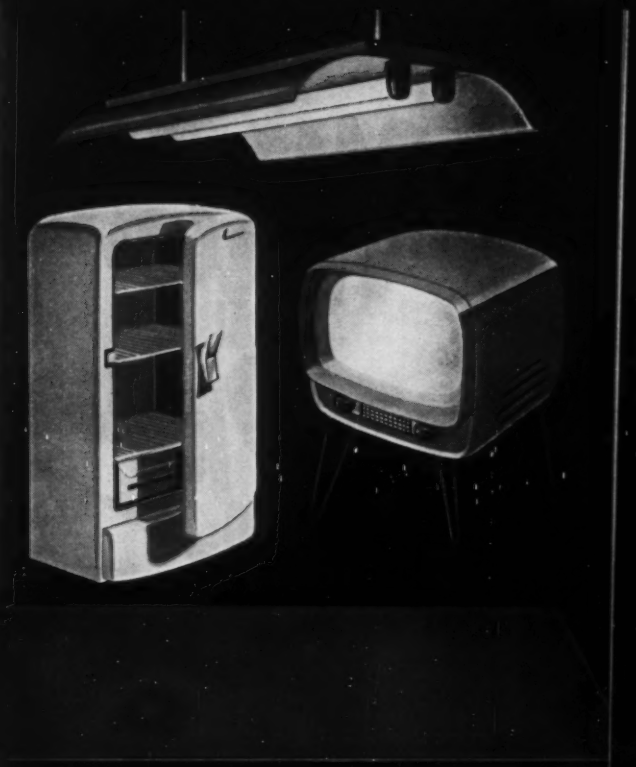
WHEELABRATOR®
CORPORATION

509 South Byrkit Street Mishawaka, Indiana

WRITE FOR details on the many new improvements in the Wheelabrator method of etching.

if your product is

PAINTED
ENAMELED
LACQUERED
LITHOGRAPHED



here's how

WEIRZIN

electrolytic zinc-coated steel

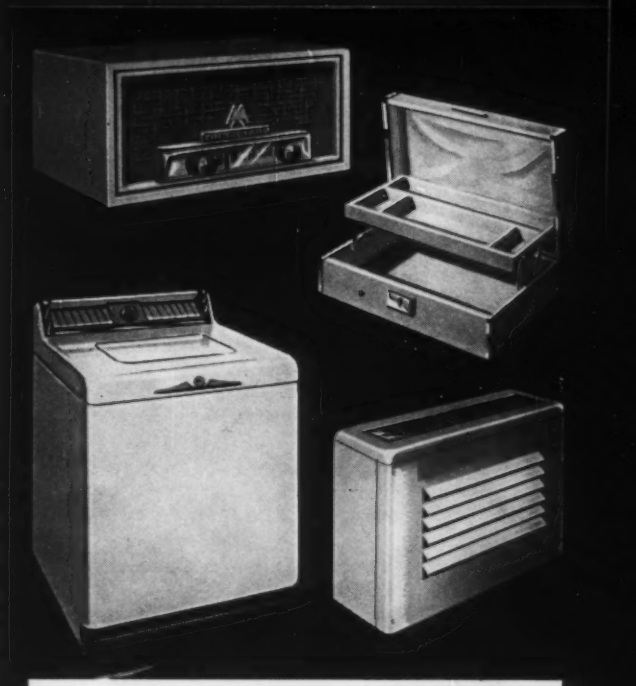
seals it against rust and corrosion

Decorative color finishes adhere to Weirzin Electrolytic Zinc Coated Steel as though they were part of it.

The secret is in Weirzin's ductile zinc coating, which is bonded to the steel so tightly that it remains intact even under the most severe conditions such as high heat or humidity, deep drawing, stamping or forming. Result: no underfilm rust or corrosion.

Thus paint, enamel, lacquer or ink surfaces cannot be attacked from underneath; hence they cannot crack, chip or flake. No wonder Weirzin products look better, last longer, sell faster!

Weirzin is available with or without chemical treatment in coils or cut lengths, in all regular widths and gauges. If you would like specific information on the many ways in which Weirzin may benefit your product, please fill in and mail coupon (right) today.



WEIRTON STEEL COMPANY
WEIRTON, WEST VIRGINIA
a division of
NATIONAL STEEL CORPORATION

WEIRTON STEEL CO., Weirton, West Virginia

I would like to know more about Weirzin.

My product is _____

NAME _____

POSITION _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE ____ STATE ____

WE'RE Mighty Proud OF YOUNGSTOWN'S DISTRIBUTORS

Youngstown Distributors are in business for only one reason—to quickly supply what you want, when you want it, and in the quantity you require. They provide you the highest quality Youngstown Pipe at the right price—by coordinating their distribution with our mill production. Yes, our hat's really off to these valuable around-the-clock suppliers for the important function they daily perform to industry.

It will pay you to know and use your Youngstown Distributor because his:

- Large stocks are immediately available which allows a reduction in your inventory.
- Single source of supply will simplify and speed up your purchasing, receiving and bookkeeping.
- Service is available around-the-clock, 365 days a year.
- Salesmen can offer valuable information on products and processes because they are constantly in touch with leading industrial plants.

Your Youngstown Distributor is as near as your telephone—why not call him today?

Specify Youngstown and secure these 7 Points of uniform goodness

uniform ductility
uniform lengths
uniform threading
uniform weldability
uniform wall thickness and size
uniform strength and toughness
uniform roundness and straightness

THE Youngstown SHEET AND TUBE COMPANY

General Offices - Youngstown 1, Ohio
District Sales Offices in Principal Cities

QUALITY YOUNGSTOWN SERVICE

YOUNGSTOWN PIPE

PRODUCERS OF QUALITY CARBON AND ALLOY STEELS FOR OVER HALF-A-CENTURY

Just plug it in, and it's ready to go!

BLISS "packaged presses" speed installation and simplify maintenance

Automation created the problem—The dopers, kickers, lifters and other materials handling devices so popular these days brought a maze of wires and pipes in their wake. And aside from looking untidy, they slowed maintenance and proved annoying to crane operators.

"Packaging" solved it—Now, in Bliss' new line of presses, all the pipes and wires, and controls are built into the uprights. Each air and electrical line is tagged—simple to find, simple to fix. Controls are centrally located. The exterior is clean and uncluttered—cranes can move up close to change dies.

Bliss designers have come up with completely new two point and four point presses—both single action and multiple action. Design features include extremely rigid frames, eccentric drives, high speed clutches, extra long connections, motorized adjustments and many others. The entire line of presses is described in a comprehensive 32-page catalog, No. 11-B, just published. Copies for you and your staff are available by writing to E. W. Bliss Company

NEW AUTOMATION CONTROL

This new nine-station rotary limit switch will control stops, starts, interlocks, motion, time, or recycles of auxiliary equipment. Each station can be set from 0° to 360°, can be operated either normally-open or normally-closed, and is accurate within less than 1°. Write for Bulletin 33.

BLISS
SINCE 1857

is more than a name...it's a guarantee

E. W. BLISS COMPANY, Canton, Ohio

Presses, Rolling Mills, Rolls, Special Machinery

U. S. Plants in Canton, Cleveland, Salem and Toledo, Ohio; Detroit and Hastings, Michigan; Midland and Pittsburgh, Pa.; San Jose, Calif.; *Branch Offices in* Burbank, Chicago, Cleveland, Dayton, Detroit, Indianapolis, New Haven, New York, Philadelphia, Rochester, San Jose, Salem, Toledo, Washington, D. C.; and Toronto, Ontario, Canada; E. W. Bliss (England) Ltd., Derby; E. W. Bliss Co. (Paris), France.
Other representatives throughout the world.

"BUFFALO" NO. 22 DRILL HELPS DISTRIBUTOR MAKE UP DIE SETS THE DAY THEY'RE ORDERED

Beals, McCarthy & Rogers, prominent steel and industrial supplies firm, makes up any of 987 die sets the same day a customer orders! To render this unique and speedy service, BM&R set up an extensive parts stockroom and completely equipped shop in its Buffalo, N. Y. warehouse. Their machines permit a rapid, accurate sequence of drilling, tapping, honing and other machining operations.

For the exacting work of drilling and tapping up to 1¼" holes in punch and die holders, BM&R selected this "Buffalo" No. 22 Drill. Reasons for the choice: (1) adequate, smooth power for this high-capacity work; (2) full rigidity and strength for long life and accuracy; (3) easy operation and adjustments — as easy as with small sensitive drills; and (4) the precision ball bearing spindle which makes "Buffalo" Drills so reliable. Too, BM&R knows "Buffalo" quality and workmanship first-hand. They've sold the wide "Buffalo" line of drills for many years, and have seen these machines perform in hundreds of shops served by BM&R.

For the best drilling value and lowest drilling cost in your shop, make it "Buffalo", the choice of leading shops for 80 years.

"Buffalo"

BUFFALO FORGE COMPANY

158 Mortimer St., Buffalo, N. Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

DRILLING PUNCHING SHEARING BENDING

Want to streamline your wire buying?

Call American Steel & Wire!

Have you been bogged down with paper work lately, thereby missing a chance to save money by streamlining your wire buying?

Your American Steel & Wire representative can be of immense help if you give him a call. For example, he may be able to suggest more economical buying units or packaging specifications, or find one type of wire that will do the job of two. Turn him loose in the plant, because he might find a lower cost way of doing the job —with a better product the result.

At AS&W, we *use* a lot of wire in our own plants, and have learned many little tricks that are yours for the asking. Just call your American Steel & Wire representative.

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

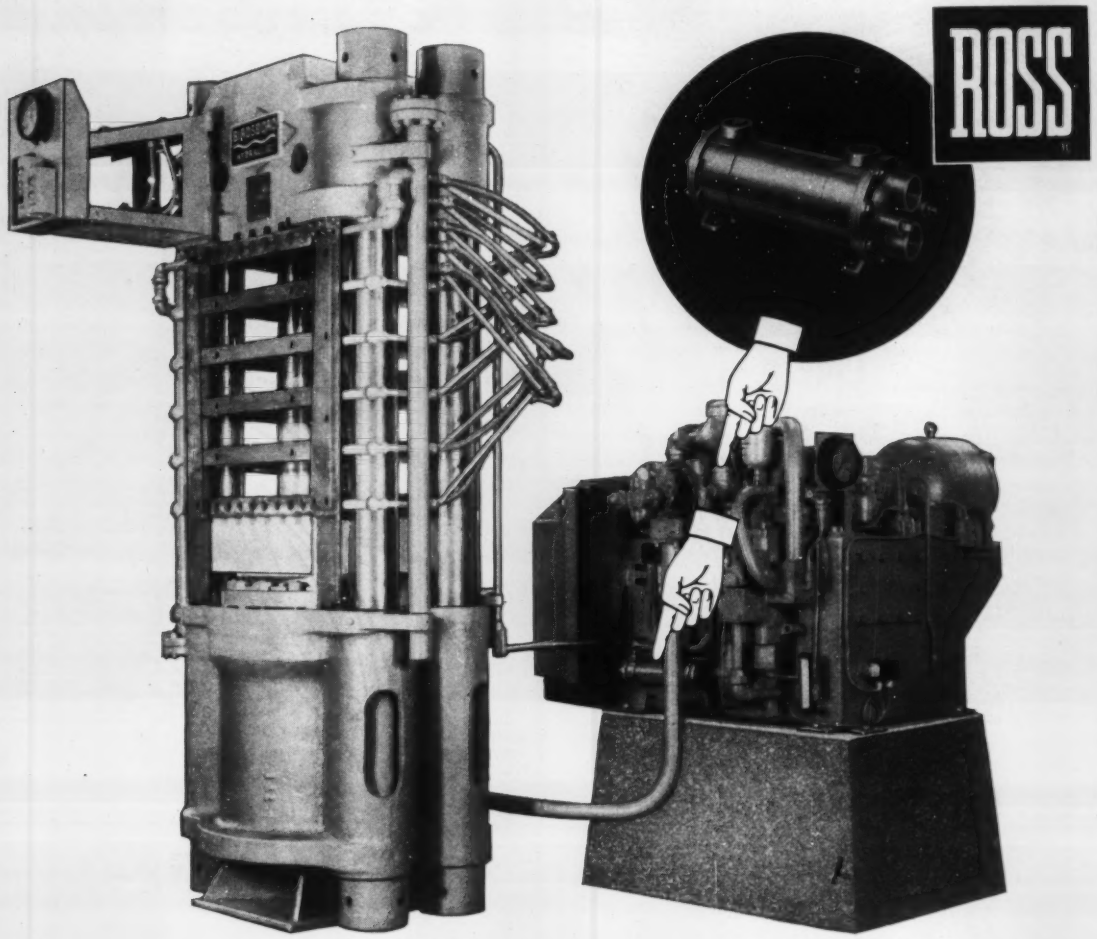
USS AMERICAN MANUFACTURERS WIRE

USS

AMERFINE —*high quality fine wire.*
AMERSPRING —*music steel spring wire.*
AMERTEMP —*heavy-duty oil-tempered wire.*
AMERLOY —*alloy heading wire.*
AMERHEAD —*uniform heading wire.*
AMERSTITCH —*extra-tough metal stitching wire.*

UNITED STATES STEEL

Squeezing out grinding wheels by the dozens this Birdsboro Press relies on a ROSS EXCHANGER for constant oil temperature



Exerting up to 600 tons of pressure, this Birdsboro hydraulic press turns out approximately 45 grinding wheels during one curing period.

A Ross Type BCF Exchanger keeps the hydraulic oil from over-heating and thinning, even under sustained pressures. Power losses are prevented, carbon deposits in the pump eliminated, and peak performance assured *at all times.*

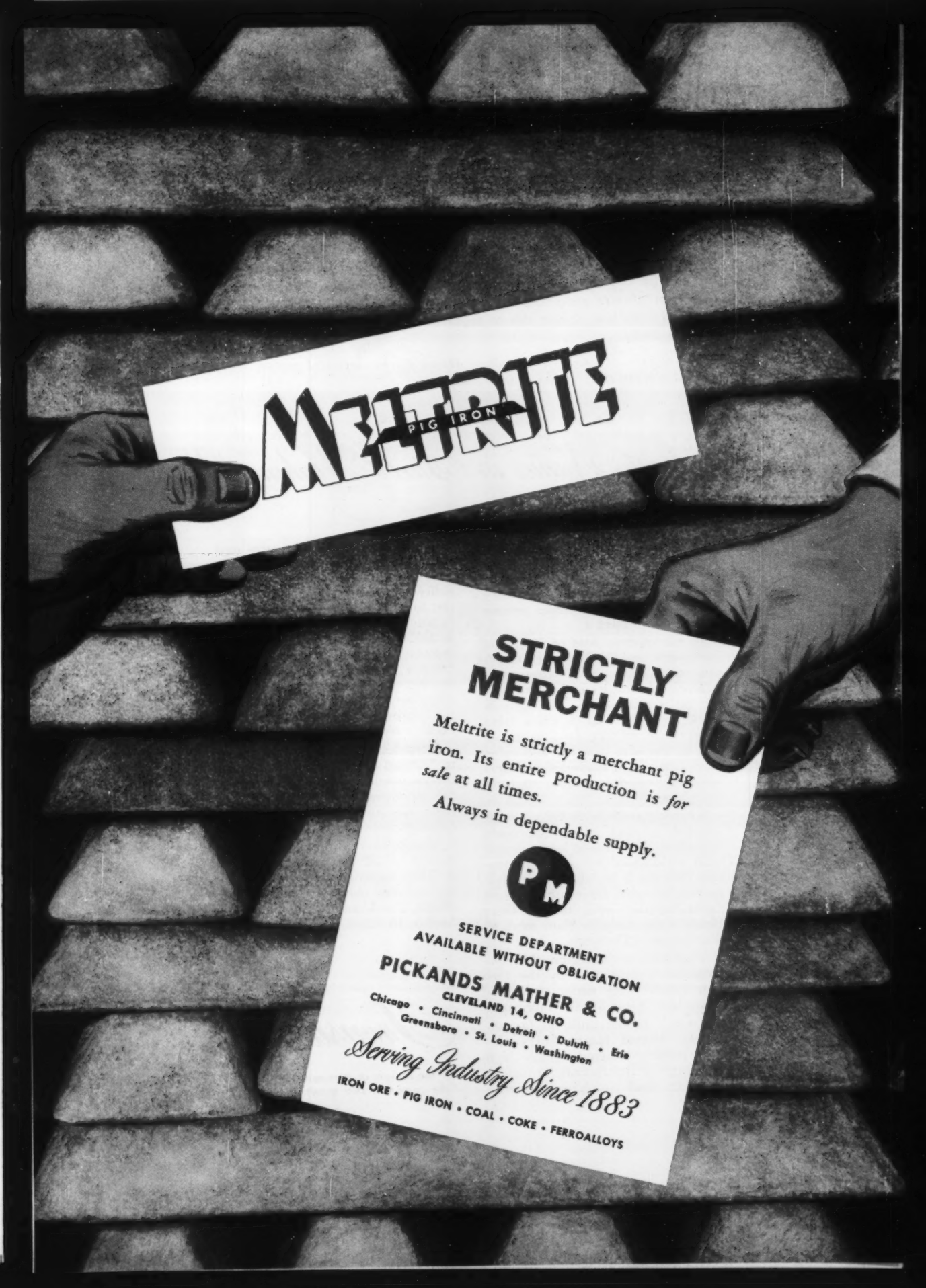
Ruggedly built to withstand punishing hydraulic shock, Ross Exchangers are unsurpassed for heat transfer efficiency. That's why they are regularly installed to safeguard performance of numerous types and makes of hydraulic equipment: extrusion and metal drawing presses, stretch-wrap formers, die-casting machines, powdered metal presses, injection and compression molding machines.

Completely pre-engineered and fully standardized, Ross Type BCF Exchangers are available in a wide range of sizes to meet your heat transfer requirements.

Learn more about the efficiency of Ross Exchangers by requesting Bulletin 1.1K5. Write: Ross Heat Exchanger Division of American-Standard, Buffalo 5, N. Y. In Canada: American-Standard Products (Canada) Limited, Toronto 5, Ont.

ROSS HEAT EXCHANGER

Division of AMERICAN-Standard


MELTRITE
PIG IRON
STRICTLY MERCHANT
Meltrite is strictly a merchant pig iron. Its entire production is *for sale* at all times.
Always in dependable supply.
PM
SERVICE DEPARTMENT
AVAILABLE WITHOUT OBLIGATION
PICKANDS MATHER & CO.
CLEVELAND 14, OHIO
Chicago • Cincinnati • Detroit • Duluth • Erie
Greensboro • St. Louis • Washington
Serving Industry Since 1883
IRON ORE • PIG IRON • COAL • COKE • FERROALLOYS

HENRY CORT *made a vital and far-reaching contribution to the steel industry when he patented his rolling process in England, in 1783. Before Cort designed and built a practical rolling mill, tilting hammers had been used to produce iron bars. This laborious process produced only about one ton of bars in 12 hours. Cort first shingled his iron into half blooms at welding temperature, then reheated and passed the hot slabs through grooved rollers of his own design. In this way he was able to produce no less than 15 tons of bars in a 12 hour period.*

While not the first to attempt rolling, Henry Cort's successful process justly earned him the title "father of the rolling mill."

Great Names in Steel Making #IV

Henry Cort's rolling mill followed a pattern as old as steel making. Whenever the need has become great enough, the right men have always developed the proper process or product to meet it.

In the modern field of industrial lubrication one thinks of such developments as the "E. P." lubricants which made today's high speed rolling mills practicable, of "Palmoshield" which freed America from dependence on imported palm oil, and of the wire drawing and cable lubricants which Ironsides engineers have originated in answer to compelling needs.

Keeping pace with 64 years of progress in steel rolling has made Ironsides' "Gear Shield" synonymous with satisfactory roll neck lubrication. So much so, that others frequently refer to their lubricants as "gear shields," even though Gear Shield is the exclusive trade mark of The Ironsides Company.

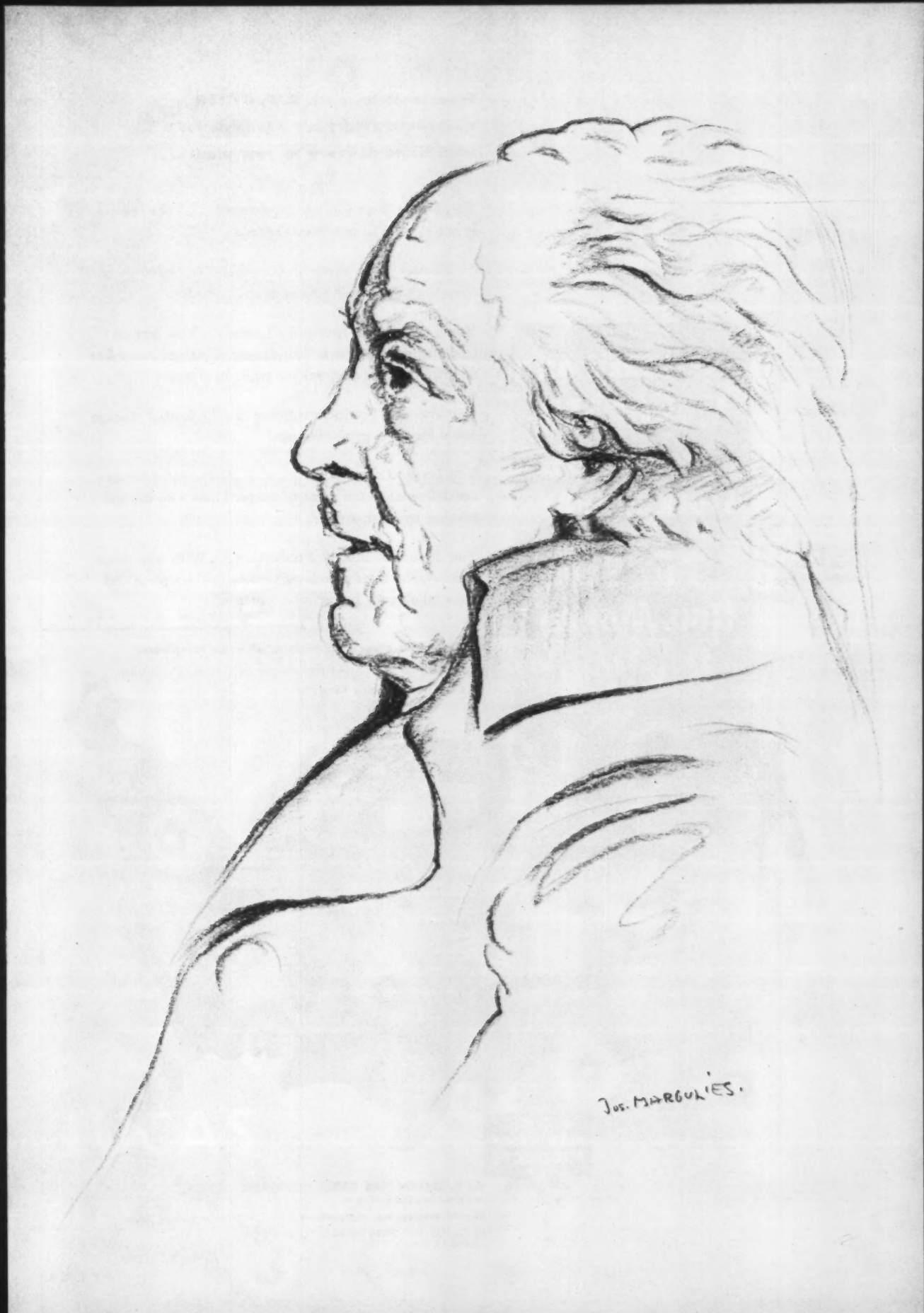
That steel men recognize this contribution is evidenced by the fact that nearly every major steel producer uses "Gear Shield" lubricants.

Today's rolling mills, so far advanced beyond Henry Cort's pioneer process, demand equally high standards in lubricants. Ironsides engineers work closely with superintendents, lubrication engineers and rollers on problems of temperature, pressure, pumpability and water repellency. Ingenuity and research are put to work until a completely satisfactory answer is found. For example, Ironsides roller bearing Shield, developed to meet the need for an extreme pressure lubricant, has load-bearing capacity in excess of bearing manufacturers' standards, and carries the approval of leading bearing makers as a result.

Ironsides engineers are prepared to "custom tailor" lubricants for the specific conditions and preferences of the individual mill. We will supply these specialized lubricants in any quantity from pail to tank car.

If you have a problem, our engineers would like to help you lick it. Their experience is at your service, without obligation. Address, or phone, The Ironsides Company, Columbus 16, Ohio.

By the makers of Palmoshield
"the palm tree that grows in Ohio"


Jos. MARGULIES.

From coast-to-coast, A. P. GREEN warehouse stocks are available for immediate delivery to your plant . . .

You Lower Your Capital Investment . . . Your capital is not tied up in warehouse space.

You Lower Your Inventory Costs . . . You have on hand only the refractories you need . . . immediately.

You Lower Your Inventory Losses . . . You buy on current prices . . . there's no danger of losing money due to price declines or breakage while in storage.

You Increase Production Space . . . By freeing storage space for more profitable use.

You Lower Labor Costs . . . A. P. Green refractories are delivered to the point of usage. There's no inplant moving by your workers.

You Maintain Steady Production . . . With less down time. A. P. Green warehouse stocks are complete and are available for immediate delivery.

THERE'S AN A. P. GREEN WAREHOUSE STOCK NEARBY

. . . to Save You Money Six Ways

Look in the classified section of your telephone directory or write for the name of the A. P. Green distributor in your locality.

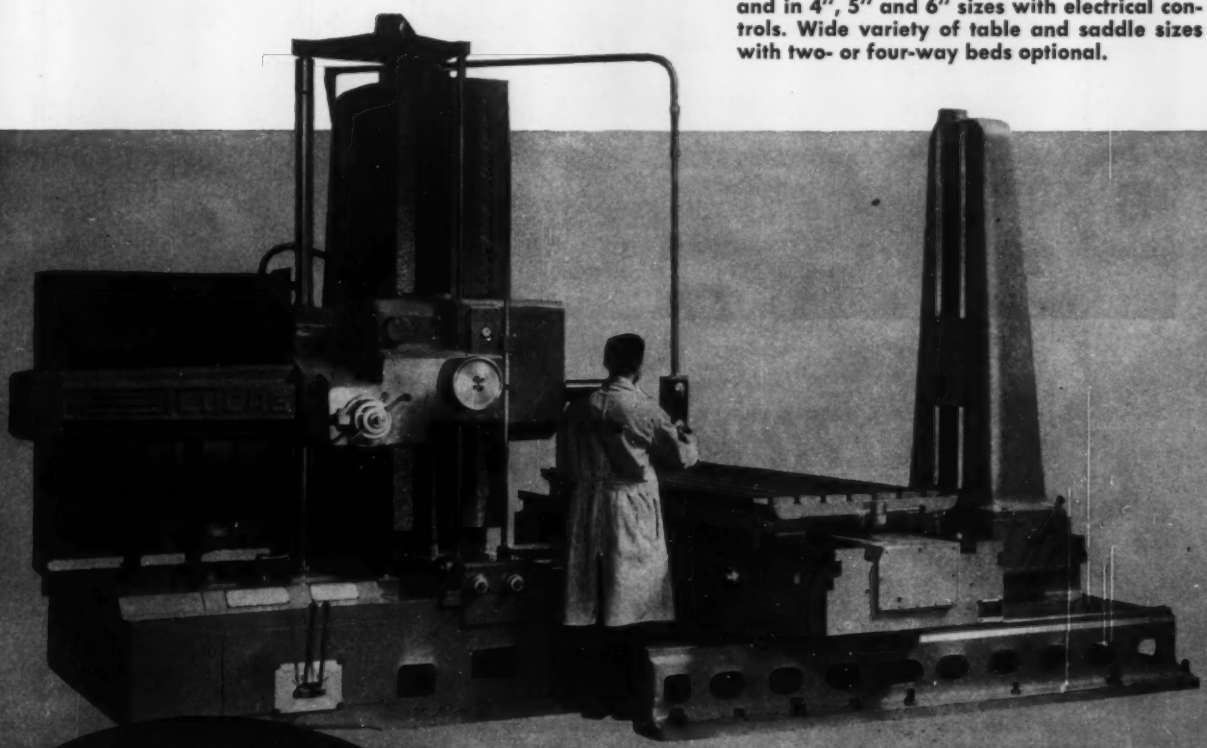
A P Green REFRACTORY PRODUCTS

A. P. GREEN FIRE BRICK COMPANY
Mexico, Missouri, U. S. A.
PLANTS: Mexico, Mo. • Woodbridge, N. J. • Sulphur Springs, Texas
In Canada: A. P. GREEN FIRE BRICK COMPANY, LTD.
Toronto 15, Ontario

there's always work for a Lucas

Extreme accuracy, feather-touch pendant control, automatic power positioning for repetitive work make a Lucas the most useful machine in any shop. There's a model and size for *your* horizontal boring, drilling and milling operations. Lucas Machine Division, The New Britain Machine Company, 12302 Kirby Avenue, Cleveland 8, Ohio.

A complete range of models, built in 3", 4" and 5" spindle sizes with mechanical controls and in 4", 5" and 6" sizes with electrical controls. Wide variety of table and saddle sizes with two- or four-way beds optional.



LUCAS
OF
CLEVELAND

A DIVISION OF THE NEW BRITAIN MACHINE COMPANY

Other New Britain Machine Tool Divisions

New Britain-Gridley Machine Division
New Britain, Connecticut

Hoern & Dilts Division
Saginaw, Michigan

A Multipress case study

Small lot production of intricate electronic parts is performed quickly and economically on this Denison hydraulic Multipress.

MULTIPRESS® speeds electronic parts assembly at General Radio

The Problem: Planning a production set-up for a company that averages a new, complex electronic instrument every month, in production lots ranging from 50 to 100,000 units.

The solution: Denison's versatile hydraulic Multipress.

General Radio Company of Cambridge, Mass., a leading designer and manufacturer of electronic test equipment, finds Multipress capable of automatic operations on volume runs, yet efficient when manually operated for small lots.

Small lot production costs have been reduced substantially. Operator safety is at peak levels. Smooth, precise pressure control produces uniform assemblies despite thickness variations in stock materials.

These Multipress benefits are typical. To find out how Denison hydraulic power can lower costs, speed production and improve quality for your company, consult a Denison hydraulic specialist. Write Denison Engineering Division, American Brake Shoe Co., 1180 Dublin Road, Columbus 16, Ohio.

DENISON HydrOILics

HYDRAULIC PRESSES • PUMPS • MOTORS • CONTROLS

Read how to increase Cupola efficiency!

If you want to save money you'll want to read "Fundamental Considerations For Cupola Operation." This 8-page, service-type bulletin – just off the press – is loaded with practical information. It discusses factors of cupola operation that affect the combustion and melting conditions. Emphasis is placed on the importance of coke quality, material size, stock distribution and "hang-ups."

The author also describes accessory equipment that aids operators in obtaining greater uniformity when even the best materials available and the best operating practice do not produce results that meet a customer's requirements. Write today for this important booklet. Request Bulletin No. FO-11.

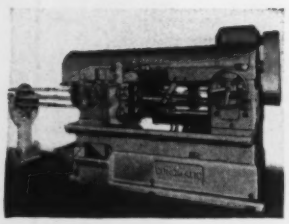
WHITING CORPORATION
15643 Lathrop Avenue, Harvey, Illinois

WHITING
FOUNDRY
EQUIPMENT

Send for any or all of these other "service-type" bulletins: "How To Make Your Cupola Operation More Efficient", FO-1 . . . "Tips On Improving Cupola Charging", FO-2 . . . "Hot Blast", FO-3 . . . "Facts On Duplexing", FO-4 . . . "Here's How To Save Melting Fuel", FO-5 . . . "The Electric Furnace In The Iron Foundry", FO-6 . . . "Cupola Blast Control", FO-7 . . . "Suggestions For Solving Some Cupola Operation Problems", FO-8 . . . "Review of Foundry-Cupola Gasses and Temperatures", FO-9 . . . "Whiting Hydro-Arc Furnace Control", FO-10. Please order by "FO" number!

If you haven't read this important booklet, your production line may be operating at less than peak efficiency. Your operations may be beating competition with HSS today, but you will likely need carbide tooling to be the leader tomorrow.

Write for your free copy of this important booklet today!



Conomatic

CONE AUTOMATIC MACHINE COMPANY, INC., WINDSOR, VT., U.S.A.

Brush wire, crimped (as shown) or straight, now produced in multiple strand, and furnished in coils or straight hanks depending on wire size.

How a **new idea in wire** *cleaned up a brush production problem*

● Maybe you can profit by the kind of interest and action applied to customers' problems by the Worcester Wire Works Division of National-Standard. Take wire brush manufacture for example . . .

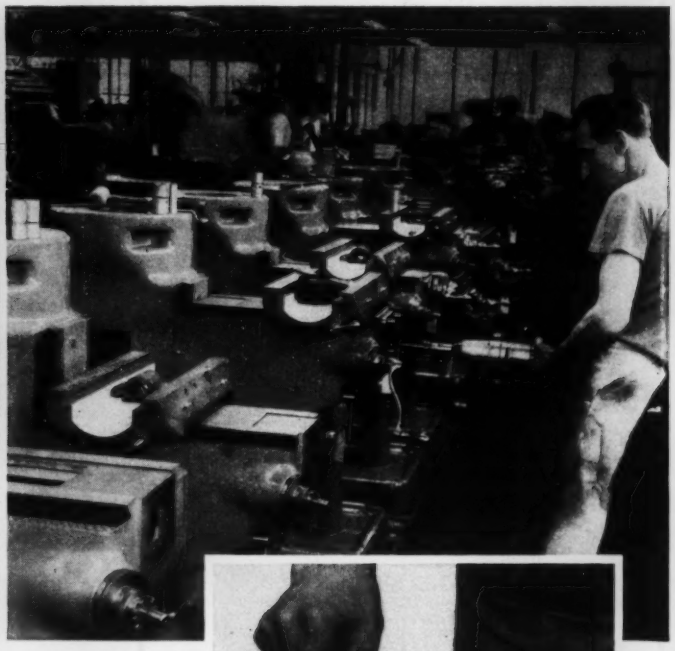
Until recently, brush manufacturers had to cut through a coil of wire, then gather by hand and by guesswork the approximate number of wires for the type of brush in production. Naturally this involved a lot of cut-off waste, plus the wire lost through faulty guesswork.

Now, to overcome this waste, Worcester Wire Works has developed ways to produce and furnish wire in predetermined bunches (up to 400 wires per bunch) with *exactly* the right number of wires for a given brush. Much costly loss is eliminated, more brushes are produced per pound of wire, and production is speeded.

The point is, Worcester Wire Works people specialize in more than quality wire. They also specialize in the kind of service and exploration that time and again cuts costs for customers. Better check with them on your wire needs. You'll like the way they do business.

NATIONAL NS NATIONAL-STANDARD Company **STANDARD**

DIVISIONS: NATIONAL-STANDARD, Niles, Mich.; *tire wire, stainless, music spring and plated wires* • **WORCESTER WIRE WORKS, Worcester, Mass.;** *high and low carbon specialty wires*
WAGNER LITHO MACHINERY, Secaucus, N. J.; *metal decorating equipment* • **ATHENIA STEEL, Clifton, N. J.;** *flat, high carbon spring steels* • **REYNOLDS WIRE, Dixon, Ill.;** *industrial wire cloth*



Above left, threading inside of Johnson bar on screw machine. Above right, general view of Bridgeport Machines Co. final assembly line. Right, Johnson Bronze part is inserted in bracket.

Bridgeport Machines Company Relies on Availability and Durability of Johnson Bronze Bars

Although it was founded less than thirty years ago, Bridgeport Machines Company is one of the nation's leading manufacturers of milling machines.

Contributing to the smooth flow of production is the prompt delivery of the Johnson Bronze bars necessary for two vital parts. "Although we use several thousand bars each year, we are able to work from a small inventory," says Mr. Victor Carlson, Purchasing Agent for Bridgeport Machines. "This is possible because of quick, efficient delivery and servicing through the local Johnson distributor."

Terming them a good, reliable item, Mr. Carlson reports that despite all sorts of conditions of use and maintenance, Bridgeport Machines has never had a complaint on the durability of the Johnson Bronze parts in their milling machines.

Even though they have needed it only once in the six years they have been using Johnson bars, Bridgeport Machines was pleased to have the field engineering service of Johnson Bronze Company available. When trouble developed on the production line a few months ago, a Johnson engineer was secured through the local distributor, and the problem was worked out in two days' time.

If you are having delivery or quality problems with your present bronze bar stock, consult your local Johnson distributor. From his list of over 400 stock sizes of cored, solid and hexagon bars, it will be easy to get the exact high-quality bars needed in your operation—without delay.

For a free catalog of Johnson products, ask your distributor or write Johnson Bronze Company, 550 S. Mill Street, New Castle, Pa.

Johnson Bearings

GRAPHITED
over 175 sizes

GENERAL PURPOSE
over 900 sizes

UNIVERSAL BRONZE BARS
over 400 sizes

LEDALOYL
over 400 sizes

ELECTRIC MOTOR
over 350 sizes

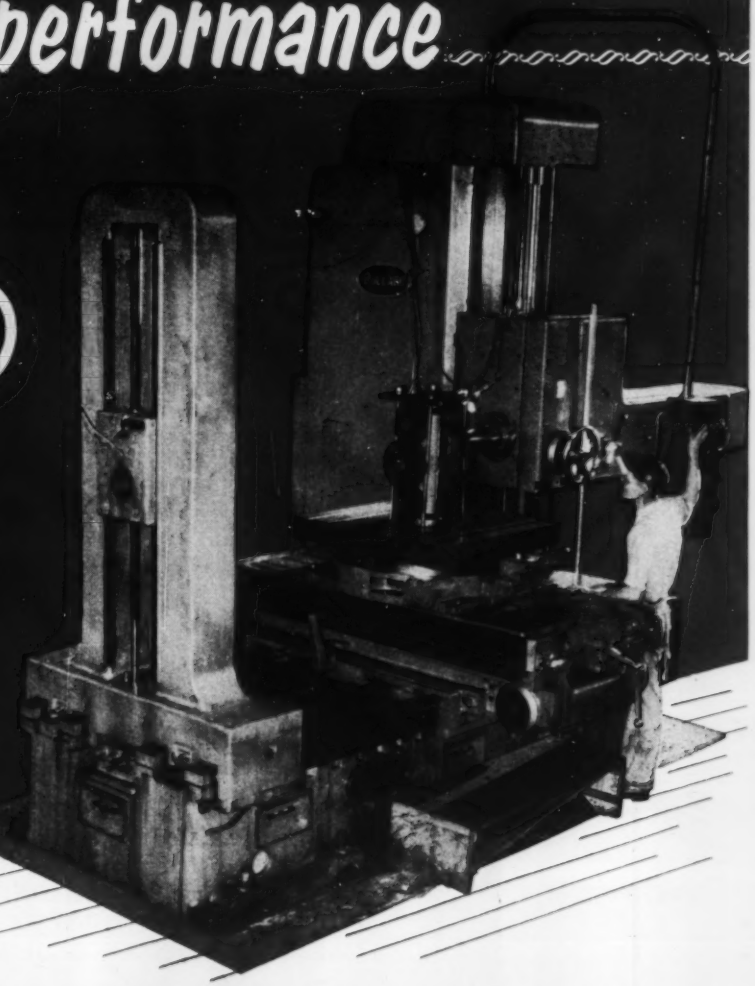
"we're getting TOP performance

from our

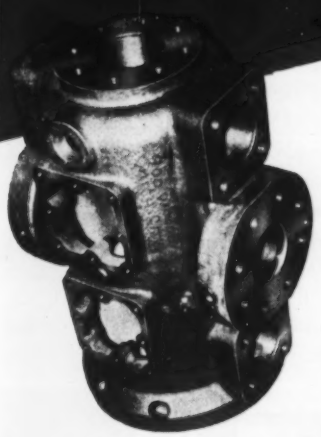
BULLARD

H.B.M.

Model 75"



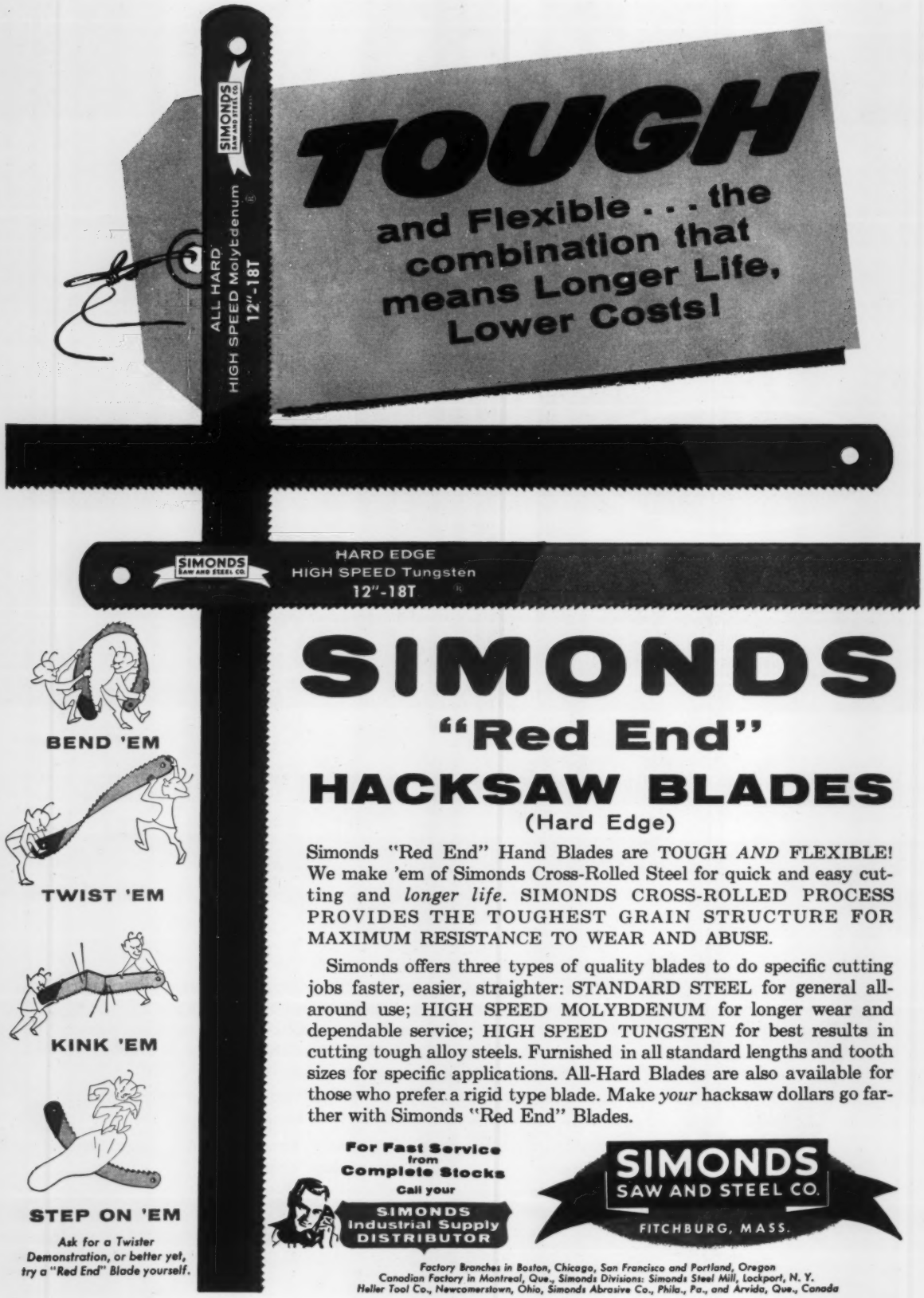
GAS CYLINDER CASTING FOR COMPRESSOR



"The acquisition of our Bullard HBM, Model 75 has eliminated a production bottleneck by giving us a reliable machine to handle our output" says Mr. Frank A. Kocevar, Chief Industrial Engineer at The Joy Manufacturing Co., of Michigan City, Indiana, manufacturers of portable and stationary compressors for industry.

This "built-in reliability" of the Bullard HBM, Model 75 can be applied to your boring, milling, drilling and facing problems — check its outstanding features by calling your nearest Bullard Sales Office or Distributor or for a complete catalog, write to —

THE BULLARD COMPANY
BRIDGEPORT 9, CONNECTICUT



SIMONDS

"Red End"

HACKSAW BLADES

(Hard Edge)

Simonds "Red End" Hand Blades are TOUGH *AND* FLEXIBLE! We make 'em of Simonds Cross-Rolled Steel for quick and easy cutting and *longer life*. SIMONDS CROSS-ROLLED PROCESS PROVIDES THE TOUGHEST GRAIN STRUCTURE FOR MAXIMUM RESISTANCE TO WEAR AND ABUSE.

Simonds offers three types of quality blades to do specific cutting jobs faster, easier, straighter: STANDARD STEEL for general all-around use; HIGH SPEED MOLYBDENUM for longer wear and dependable service; HIGH SPEED TUNGSTEN for best results in cutting tough alloy steels. Furnished in all standard lengths and tooth sizes for specific applications. All-Hard Blades are also available for those who prefer a rigid type blade. Make *your* hacksaw dollars go farther with Simonds "Red End" Blades.

For Fast Service from Complete Stocks
Call your
SIMONDS Industrial Supply DISTRIBUTOR

SIMONDS SAW AND STEEL CO.
FITCHBURG, MASS.

Factory Branches in Boston, Chicago, San Francisco and Portland, Oregon
Canadian Factory in Montreal, Que., Simonds Divisions: Simonds Steel Mill, Lockport, N. Y. Heller Tool Co., Newcomerstown, Ohio, Simonds Abrasive Co., Phila., Pa., and Arvida, Que., Canada

Another **STANLEY STEEL STRAPPLICATION*** on the job

Making 3 times 16 equal ONE

3 tiers of cylinder head forgings, 16 forgings to a tier, make a sum total of 48. But secured to a pallet by the Stanley "Uni-Tie" Method, all 48 become ONE compact package, easier for this Cleveland manufacturer to handle, store and ship. Using the Stanley Electric Skid Magazine Power Tool, every strap is effortlessly and speedily pulled up to the same pre-determined tension, so there's no danger of the strapping loosening or the load shifting.

Perhaps teaming up the Stanley "Uni-Tie" Method with the Stanley ESM Tool is the way for **you** to save time, space, man-power or eliminate costly containers. But whatever your packaging or shipping problem, Stanley has ways to solve it. **WRITE FOR YOUR FREE COPY** of the "Stanley Strapplication Manual of Packaging and Shipping" to **STANLEY STEEL STRAPPING,** Division of The Stanley Works, Dept. B, 1476 Lake Street, New Britain, Conn.

INSURE IT-SECURE IT-WITH STANLEY STEEL STRAPPING

STANLEY

**The system-atic way to solve specific packaging and shipping problems*

STANLEY TOOLS • STANLEY HARDWARE • STANLEY ELECTRIC TOOLS • STANLEY STEEL STRAPPING • STANLEY STEEL

Rework your Monel ...it can give you years more pickling service

Look closely at this pickling crate separator pin.

See those go-nowhere threads and the weld beneath them? They tell a story. For years this piece of Monel* nickel-copper alloy has been used and re-used in pickling equipment. No one at Ingram-Richardson Manufacturing Co., Beaver Falls, Pa., can begin to tell all it has done.

But *this* they do know. Years ago they reworked the original piece. Made it and dozens of other Monel rods into separator pins. For at least 20 years, the metal has been in and out of the pickling bath.

Now look at the pin again. Sure, there are some signs of corrosion. But a nut on those Monel threads would *still* grip. And you can see the rod is sound as a dollar, good for many *more* years' service.

Wrought Monel alloy gives you important weight, safety, strength and design advantages in original equipment. After its original usefulness is dissipated, you can rework it and re-use it. Often several times.

Next time you order batch pickling fixtures, specify Monel nickel-copper alloy. In the meantime, get the newest Inco booklet, "Equipping the Pickle House." Write:

*Registered Trademark

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street New York 5, N. Y.

INCO TRADE MARK **NICKEL ALLOYS**

Monel . . . for proved pickling life

STEEL
February 4, 1957

Metalworking Outlook

Steel Earnings Good

Look for 1957 to be another good earnings year for the steel industry—at least equal to 1956. Scattered preliminary reports show these net profits (1956 compared with 1955): U.S. Steel Corp., $347,865,150 vs. $370,099,353; Youngstown Sheet & Tube Co., $43,174,587 vs. $41,701,140; Armco Steel Corp., $65,250,000 vs. $64,350,609; Granite City Steel Co., $15,109,000 vs. $12,611,000; Barium Steel Corp., $6,560,000 vs. $655,318; Alan Wood Steel Co., $3,096,000 vs. $2,552,000. There will be no national steel strikes this year, and production should be substantially higher.

More Canadian Expansion

In 1957, you can expect Canada to: 1. Increase capital spending over 1956's record $7.5 billion (Canadian dollars). 2. Hold exports at current high levels—$4.85 billion in 1956. Canada's gross national product jumped 11 per cent last year to $29.5 billion. Imports were $5.8 billion, compared with $4.7 billion in 1955. Much of the increased imports were the machinery, steel and industrial materials needed for capital goods production.

Road Equipment Makers Roll

American road equipment builders predict sales of $1.2 billion in 1957. The spur is the government road program which will push total highway spending to $5.6 billion this year and to $6.5 billion annually in 1958 and 1959. But the outlook also has two dark spots: The steel shortage and tight money. The steel situation hits both production and expansion plans of the equipment makers. Many companies admit they're purchasing 30 per cent of their plates and structurals from "other than mill sources." A Chicagoan reports paying as much as double mill prices on the gray market. The American Road Builders' Association, which convened in Chicago last week, thinks the tight money situation will improve. It's creating a task force to study the matter.

Industrial Traffic Rising

American industry may ship more goods more miles than ever before this year. Steady increases point that way. The Chamber of Commerce of the U.S. estimates total intercity ton-miles hit 1320 billion in 1956, 4 to 6 per cent higher than in 1955. Railroads had a 4.2 per cent gain; intercity truck ton-miles jumped 6.2 per cent; oil pipelines report hikes of 11 per cent; inland waterways, excluding Great Lakes operators, enjoyed a 10 per cent rise; and the domestic airline industry showed 10.3 per cent hikes. Great Lakes shipping dropped 1.3 per cent because of the steel strike.

Small Business Slips

The small business share of military contracts slumped to 18.3 per cent of all prime contracts in the July-September quarter of 1956. That com-

Technical Outlook—p. 99 Market Outlook—p. 147

pares with 19.6 per cent in fiscal 1956, 21.5 per cent in fiscal 1955, 25.3 per cent in fiscal 1954 and 16.6 per cent in fiscal 1953.

School Program: Rough Sledding

President Eisenhower's $1.3 billion school construction program ($325 million annually for four years) will face rough sledding from congressmen who believe it will lead to federal control of the nation's schools. But odds still favor its passage.

Tips on Recruiting Engineers

Are you having poor luck in recruiting engineers? Take a look at the approaches these organizations have tried, all of which have proved successful: Surface Combustion Corp., Toledo, O., and Girdler Co., Louisville, are among numerous firms that have set up engineering departments in Florida; Material Handling Institute Inc. has inaugurated a promotional program on behalf of its membership pointing out the career opportunities in the industry; Kaman Aircraft Corp., Bloomfield, Conn., has enlisted the aid of its more than 3000 stockholders to recruit engineers.

Tiny Battery Is Nuclear Powered

A miniature nuclear-powered battery (its diameter is no greater than the head of a thumbtack) has been developed by Elgin National Watch Co. and Walter Kidde Nuclear Laboratories Inc. Safe for personal use, the battery has a nominal output power of 20 microwatts and uses the decay energy of beta-emitting radioisotopes as its energy source. Possible uses: Hearing aids, miniature portable radios, civil defense warning receivers for the home and atomic-powered wrist watches.

Gains in Gas Turbines

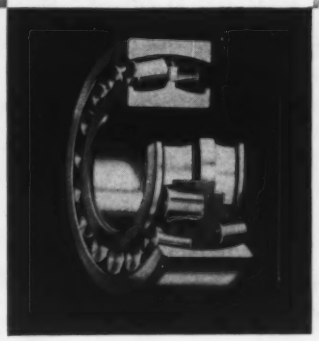
Watch developments in gas turbines. In commercial operation for only seven years, the gas turbine is now doing or soon will do such different jobs as powering a Liberty ship, providing power and exhaust heat for a rubber factory, generating power for utilities and pumping crude oil through pipelines. Some 114 General Electric Co. gas turbines have already accumulated more than 1.5 million hours of operation.

Straws in the Wind

A study on government leasing of machine tools will be finished late this month and released to the public early in March . . . A Senate task force will investigate proposed shutdowns of government-owned defense plants (reportedly, ammunition producers) . . . Jones & Laughlin Steel Corp. is going ahead with construction of two electric furnaces in Cleveland, despite its pending acquisition of Rotary Electric Steel Co. . . . Industry's maintenance costs rose more than $1 billion (9 per cent) last year, delegates were told at the Plant Maintenance & Engineering Conference in Cleveland.

TORRINGTON SPHERICAL ROLLER BEARINGS GIVE YOU THESE FEATURES

- inherent self-alignment
- conformity of rollers to races
- positive roller guidance
- land-riding bronze cages
- integral flange for stability
- maximum radial and thrust capacity
- long, smooth service life
- even load distribution



Mated perfectly ~ for life!

Make a point to notice the roller end and center guide flange in a Torrington Spherical Roller Bearing. The perfect mating there means a smoother, longer bearing life.

Roller end and flange surfaces alike are ground to a common spherical radius centered on the common vertex of bearing axis and roller axis. Under all load conditions, the rollers bear lightly but constantly against this flange. This guides the roller positively with minimum friction and prevents skewing. Stress concentrations leading to early failure are avoided, so the bearing will serve you many good turns longer.

This is the kind of feature Torrington builds into its bearings out of its experience with all major types serving in all kinds of equipment. Care for such details is matched only by our care in mating the *right* bearing to the *right* job. In this, your Torrington representative is an expert: call on him when you need help. *The Torrington Company*, South Bend 21, Ind.—Torrington, Conn.

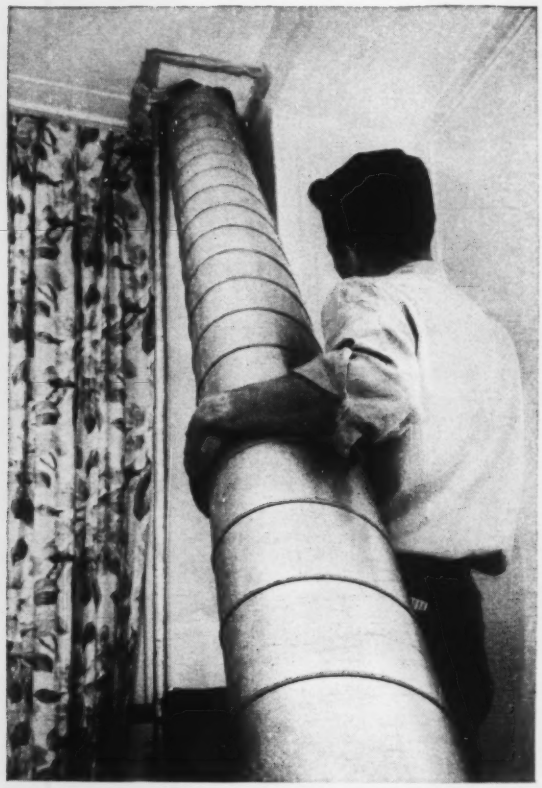
TORRINGTON BEARINGS

District Offices and Distributors in Principal Cities of United States and Canada

SPHERICAL ROLLER • TAPERED ROLLER • CYLINDRICAL ROLLER • NEEDLE • BALL • NEEDLE ROLLERS • THRUST

In Hotel Statler, New York City...

ARMCO ZINCGRIP STEEL GUARDS CONDUITS WHERE MAINTENANCE MEN CAN'T GO



Production of conduits requires severe lock seaming, but the zinc coating on Armco ZINCGRIP Steel stays tight and unbroken. That's why conduits like this one are expected to last the life of the air conditioning system—even where inaccessible to maintenance men.

Miles of conduits and ductwork are required in the modern air conditioning system that serves 2,200 rooms of the giant hotel.

Conduits for the new air conditioning system in New York City's Hotel Statler are made of Armco ZINCGRIP® Steel. According to the project engineer in charge, this is why:

"The galvanized bond of Armco ZINCGRIP Steel is completely reliable. We can lock-seam without causing damage to the coating. This means that *conduits can be placed in inaccessible parts of the building* . . . in vertical rises between floors for example, without further attention for an indefinite period. *They'll last the life of the system itself.*" And further . . .

"In those areas where conduits are exposed, their attractive appearance does not detract from the residential nature of the hotel."

20-YEAR RECORD

For more than 20 years, drawn and severely formed parts of many kinds of products have been made of Armco ZINCGRIP Steel at cost savings.

The reasons:

1. No flaking or peeling of the patented hot-dip coating.
2. Elimination of finishing after fabrication.
3. Production advantages of ZINCGRIP coils.

Many years of experience in hundreds of plants back up this fact: *Anything that can be done with sheet steel can be done with Armco* ZINCGRIP.

ARMCO STEEL CORPORATION

817 Curtis Street, Middletown, Ohio • Sheffield Steel Division • Armco Drainage & Metal Products, Inc. • The Armco International Corporation

Don't Cry Wolf

During the past three weeks, many stories predicting a slowing down in the economy have appeared in daily newspapers, some news magazines, syndicated columns and service letters. They are based on the postponement of a few expansion projects, a turndown in some new order indexes, the decline in new housing starts and a softening in demand for cold-rolled sheets.

The reporting is accurate. But the interpretation of the facts often is exaggerated.

This brand of journalism is causing caution and hesitancy. One article predicting a drop in steelmaking operations is credited with causing a break in the stock market.

We always have believed business news should be reported objectively. Adverse and favorable news should be given equal attention. But we believe in presenting the whole picture. In fact, we think it is imperative.

Let's look at the so-called slowdown symptoms.

Frequently mentioned is the softening in cold-rolled sheet demand. Actually, this started last summer. It is only now being discovered by the general papers. Demand has shifted from cold-rolled to other products. Steel ingot output in January was about 11 million tons, near an all-time record. Many producers report incoming orders for the month exceeded shipments.

Some new order indexes are tending downward. Others are continuing upward. We examined the 32 indexes used in the Business Trend department in this magazine. Sixteen, exactly half, show gains for the latest month and 16 show losses. Compared with a year ago standings, 17 are higher and 15 are lower.

Housing starts are down. But the building of schools, hospitals and other light public works is tending upward.

Deferred industrial expansions by major companies have commanded large headlines. But expenditures for new plant and equipment still are running high. Present estimates call for an 11 per cent increase in 1957 over 1956. That is a substantial gain, although lower than the 22 per cent increase recorded in 1956 over 1955. It would be ridiculous to expect a succession of 20 per cent gains in an expanding capacity. Our markets are growing but not that fast.

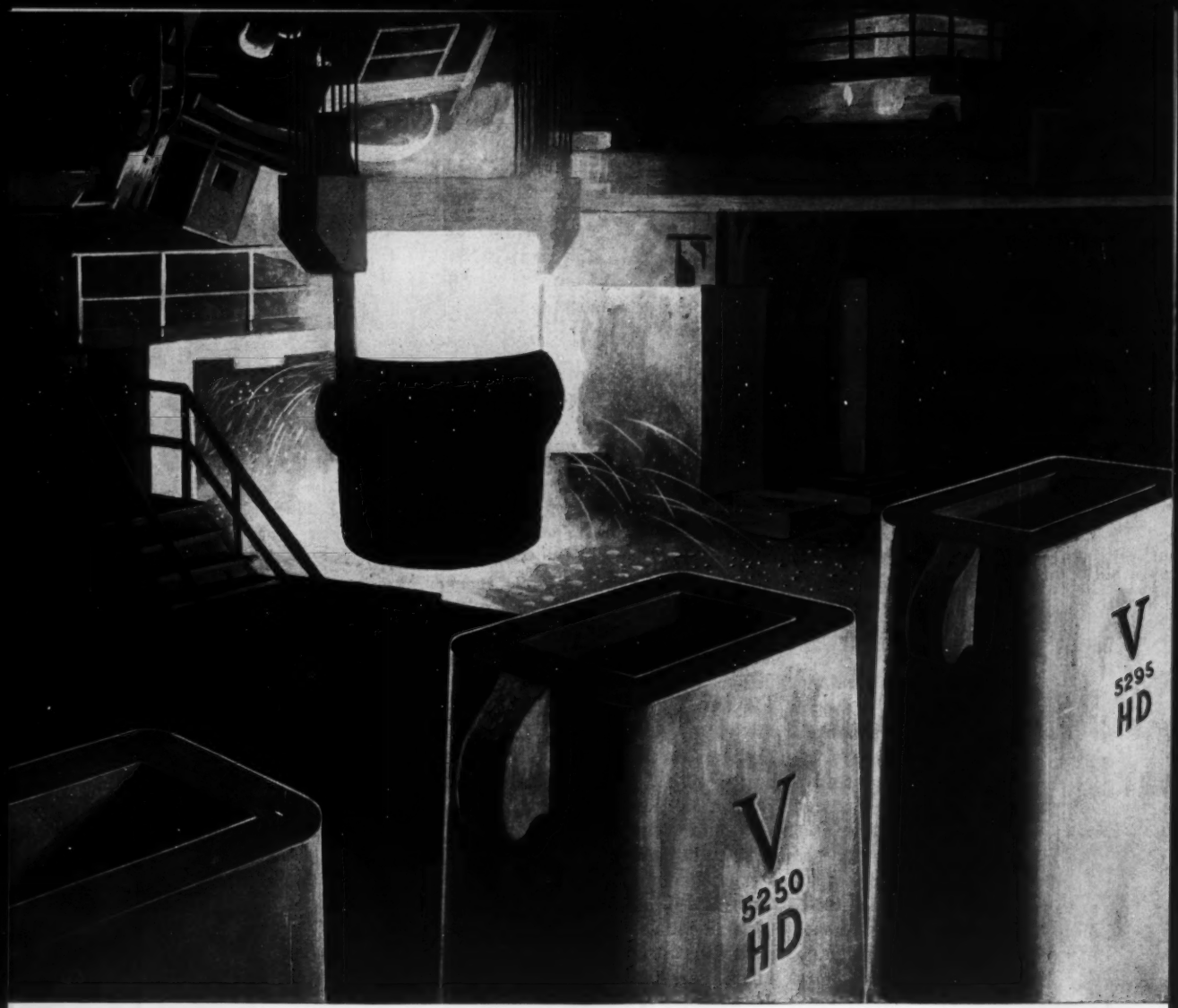
While a number of shifts are taking place within the economy, we are continuing to fully utilize the men, machinery, materials and money available. The demand for goods and services continues to press against available supplies.

We will have rolling adjustments. That is to be expected in a free, competitive economy. Focusing attention on the soft spots will only give us a distorted picture.

Let us not talk ourselves into a recession. Let us not cry wolf.

Walter J Campbell

EDITOR



All ingot moulds by Valley are designed for individual steel plant conditions. These moulds have been proven the highest quality available to the steel producing industry today.

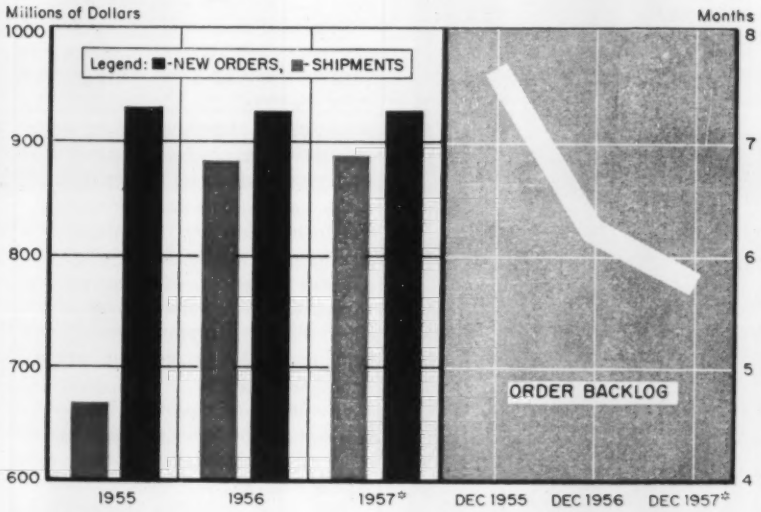
VALLEY MOULD AND IRON CORPORATION

General Offices: Hubbard, Ohio

Western Office: Chicago, Illinois

Northern Office: Cleveland, Ohio

Tools: Shipments Up, Orders Steady, Backlogs Down



*Estimated by STEEL.
Source: National Machine Tool Builders Association.

No Slump for Capital Goods

Look for another good year in '57. Equipment builders aren't alarmed by the dip in new orders which came for some in November or December. Machine tool makers are optimistic

ONE MONTH doesn't make a bust. That's the conclusion of capital equipment makers as they ponder scattered reports that they're in for a business slowdown.

Some of the gloomy forecasts apparently arise because machine tool orders dipped to $57 million last December from a year's average of about $77 million monthly.

Optimism — But the builders, whose business fortunes often parallel experiences in other capital lines, are not concerned about an order dip below the "abnormally high" levels of 1955 and 1956. They welcome a decline in order backlogs to more manageable levels. They aren't getting as much big automotive business, but they're winning more smaller orders.

Listen to 11 builders talk about 1957:

J. A. Raterman, president, Monarch Machine Tool Co., Sidney, O.: I don't look for machine tool business to go any higher this year. It may drop some, but that's not unhealthy.

R. D. Lawson, vice president, Grinding Machine Division, Norton Co., Worcester, Mass.: Everything points to a year equal to 1956. Even with a slowdown in automotive buying, we expect good business.

W. K. Bailey, president, Warner & Swasey Co., Cleveland: We're now at a peak. Some dropoff is expected, but not feared. We expect to sell at the 1956 level and to increase our shipments.

C. R. Kubik, executive vice president, Motch & Merryweather Machinery Co., Cleveland: You can't fear a slump based on the poor showing of a few months. Last month was a good one for us.

E. C. Bullard, president, Bullard Co., Bridgeport, Conn.: We still think 1957 will be a good year. Our major concern is not the lack of orders, but the inbalance in orders among our machine types.

R. E. Cross, executive vice president, Cross Co., Detroit: There's no gloom. Business for us will be better in 1957 than it was last year. We're working a 66-hour week in some departments.

N. M. Forsythe, vice president, National Automatic Tool Co. Inc., Richmond, Ind.: There is a dip in incoming business, but we continue to expect as good a year as we had in 1956. We're still working overtime on a good backlog.

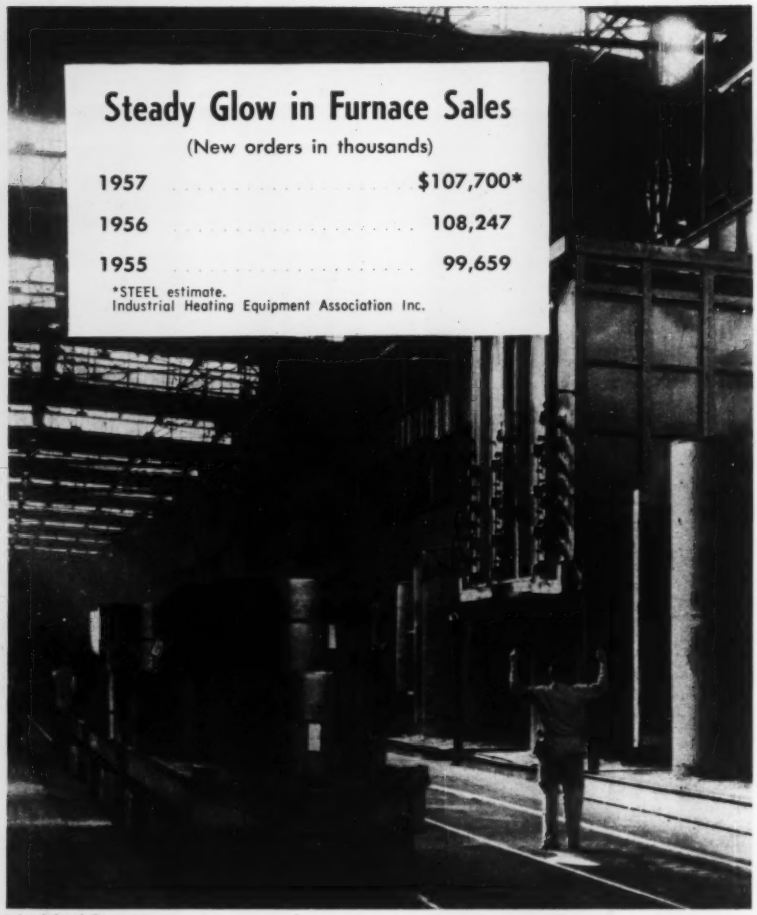
H. D. Sharpe Jr., president, Brown & Sharpe Mfg. Co., Providence, R. I.: If there is a slight dip, there's no cause for alarm. Our forecasts all are based on a year equal to 1956.

F. V. Geier, president, Cincinnati Milling Machine Co., Cincinnati: Unfilled orders are $9 million above those a year ago. We're adding capacity at three domestic and two overseas plants.

B. F. Olson, president, Sundstrand Machine Tool Co., Rockford, Ill.: Our incoming orders will continue to be good in 1957, even though they might be off slightly from last year's. Shipments this year will be greater than last year's.

R. Marriott, executive vice president, Barnes Drill Co., Rockford, Ill.: We still have plenty of chances to quote. We expect to continue at a high level this year, perhaps even better than in 1956.

The story's the same in other capital lines. Trade association spokesmen for makers of electric overhead cranes, foundry equipment, resistance welders and material handling machinery agree that '57 will be a plateau year—any increases over '56 will be less spectacular than '56 gains over '55. Industrial furnace makers echo that sentiment (page 60), as do component producers (page 77).



Inland Steel Co.

Furnace Sales Hold Steady

Industrial Heating Equipment Association conventioneers remain confident. Steel mill buyers will give the industry strength; autos and appliances may be soft spots

INDUSTRIAL furnace sales in 1957 will be within 1 per cent of last year's peacetime record, say industry sources.

New orders in the fourth quarter of 1956 were lower than expected, but they haven't dampened the outlook for 1957. Last year's sales bettered predictions by 20 per cent.

High Hopes—Contributing to the good year ahead are the trends to: 1. Mechanization to cut costs and improve quality. 2. Increased performance demands. 3. New metals that require special equipment. So says Carl L. Ipsen, executive vice president, Industrial Heating Equipment Association.

Comments W. H. Holcroft, executive vice president, Holcroft & Co., Detroit: "We've reached the point where equipment just five years old is showing signs of obsolescence."

Sales to steel mills also look good. Henry M. Heyn, vice president, Surface Combustion Corp., Toledo, O., sees a 25 per cent increase ahead in his company's new orders from the steel industry.

Nonferrous industry buying should hold steady; home appliances may be quiet; auto orders may fall off in the second half.

Prices—Prices will go up 3 to 6 per cent (perhaps even more) in 1957 in spite of a continuing price fight within the industry. The situation is aggravated by companies which are buying their way into the industrial furnace business, comment some sources.

Other industry problems: 1. Shortage of sales and design engineers (reports of pirating are numerous). 2. Shortage of nickel (it's pinching manufacturers now and seems to be getting worse). 3. Maintenance: The industry wants users of heat treating equipment to adopt the same high standards of maintenance as they give other production equipment.

But most industry leaders echo the expectations of Elton E. Staples, executive vice president, Hevi-Duty Electric Co., Milwaukee: His company's business will be up 5 to 10 per cent in 1957. Last year's performance topped that of 1955 by 30 per cent.

Officers — New association officers: Mr. Holcroft (president); C. F. Olmstead, president, Lee Wilson Engineering Co., Cleveland (vice president); R. E. Whittaker, secretary, Swindell-Dressler Corp., Pittsburgh (secretary).

W. H. HOLCROFT
. . . new president, IHEA

How To Recruit, Hold Ph.D.'s

AMA considers the problem of the creative scientist and engineer in industry. Consensus: People working in research or advanced engineering must have freedom

"ISAAC NEWTON wasn't under any commercial pressure to come up with the law of gravity."

Coming from a research engineer, this comment pinpoints a problem facing metalworking companies: How can creative scientists and engineers be adapted to industry?

A seminar on creativity in research engineering, sponsored by the newly formed Research & Development Division, American Management Association, came up with two positive approaches: 1. Creative personnel must be given proper atmosphere. 2. Recruiters should seek men best qualified to adapt to company philosophy, not just grab the first available Ph.D.

Atmosphere — Seminar consensus: The individual working in basic and applied research or advanced engineering must have freedom. He may be more strongly motivated by the disciplines of his profession than by loyalty to an employer. Reported one research manager: "We had poor relationships with our research crew until they were given more opportunity to go back to the university campus, report to their peers and be judged by them."

It's a two-sided coin for the research manager. He must be able to understand the proposals of his creative staff, yet be able to develop the type of man who understands the direction the company must take to keep its markets. Biggest problem: Knowing how to hold back some new ideas so that a project can be completed without dampening the spirits of the creative thinker.

Barometers — Here are some other ways research scientists and engineers can be kept happy.

- Present the problem, but not the approach for its solution.
- Let the staff associate with counterparts in related fields.
- Give the rugged individualist every chance to prove himself.
- Keep the problem challenging even though the product needed may have already been outlined by management.
- Speed research results to management (they sometimes get pigeonholed on the research manager's desk).
- Judge completed work on approach to the problem, follow-through and attitude.

Recruiting—How can you know that the Ph.D. being considered for employment is creative, has drive and will follow a project from start to finish? Ask these questions: 1. Does the candidate have an alert, inquiring mind? 2. How does he attack a problem? 3. Is he interested in things other than his own specific research problem? 4. What does he read? 5. Does he have a good memory? 6. Do associates respect him? 7. Is there a spark in his eyes when talking about his favorite project? 8. While doing graduate work, did he display follow-through?

Warned one speaker: "It must be kept in mind that some postgraduate students may only be mimics of a professor's favorite subject—sharecroppers rather than creative thinkers."

Storm Flags—Recruiters for this higher echelon work should be graduate engineers, reported the seminar. This helps to bring about a favorable initial contact which is indispensable in successful recruiting. But the prospective employee must be sold at the laboratory, not at the recruiter's table.

Reported seminar speakers: "The personnel man can only set the tone, handle the prospective employee in a professional manner. It takes the best technical men to evaluate and interest the most creative candidates."

Piped up one panel member: "It takes a brain to know a brain."

Crux — Don't oversell, seminar scientists warned. The worst thing that can happen to an organization is to have a newly hired researcher feel that he was sold a bill of goods.

Management's responsibility: To be flexible enough so that a creative engineer never mutters: "Despite management, a new product was developed."

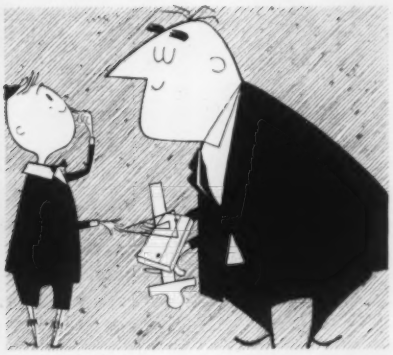
Cleveland Upgrades Workers

Production operators of engine lathes will have a chance to become skilled workers under a plan sponsored by Associated Industries of Cleveland in co-operation with the Adult Education Division of Cleveland's Board of Education.

The program consists of 180 hours of work.

Sessions are held once a week for four hours (three hours of shop practice and one hour of related technology).

Men at AMA seminar study problem of company scientists



To use engineers better, A. O. Smith Corp.'s . . .

Subsidiary Solves Problem

PEAK engineering loads can create more executive migraines than the technical problems involved do. A. O. Smith Corp., Milwaukee, is trying a new approach to the puzzle.

Like most companies, A. O. Smith has been meeting peak engineering load periods by working its engineering staff overtime and farming out jobs to consultants. "Basically, this is still a good approach," says Waldo Higgins, chief engineer. "But it has three limitations."

No Return—"1. In working an engineer overtime—or anybody for that matter—you reach a point of no return. After too many hours, efficiency of the individual drops. Most engineers don't mind and even welcome a little overtime with its time-and-a-half pay; but excessive overtime can become objectionable.

"2. Consultants also have peak load periods, and these often coincide with yours and others in your industry. This poses the problem of getting your project scheduled to fit your own timing.

"3. In working with outside engineering consultants, it generally takes considerable time from two or more of your own engineers to acquaint the consultant with your products and facilities as well as define the job to be done."

Own Firm—To meet these limitations, the Milwaukee firm has formed its own outside consultant firm, A. O. Smith Engineering Service Corp. Its nucleus is 12 top-notch engineers from the parent company. Heading it up is D. W. Sherman, one of the country's top auto frame specialists, who has had wide engineering experience with most of the company's other products.

With facilities set up in the former Milwaukee Gear Co. plant, the firm will function as an independent organization, providing consulting engineering services to other firms as well. Its relations with the parent company will be maintained on a strict consultant-client basis. Bids on projects will be submitted, and A. O. Smith will be billed for services rendered. It will have to operate as a profitable organization on its own, officials emphasize.

Advantages—Mr. Higgins points out: "We'll be able to get our projects scheduled and save considerable liaison time because it's in the same city. Equally important, there'll be men available who know our products, facilities and problems and can tackle our projects with a minimum of preliminaries."

The new firm will be developed cautiously. Additional staff members and assistants will be hired, and plans are to maintain a well-balanced organization capable of providing a broad area of engineering services. Facilities will be built to permit prototype building and testing.

"There's no definite blueprint for eventual size of the organization or the percentage of A. O. Smith work it'll do," officials relate. "We'll depend upon experience to dictate the direction the firm may go."

Conclusion—"Admittedly," says Mr. Higgins, "this is an experimental venture for us. We'll continue to use other outside consultants, and we are still expanding internally. This year we are adding some 80 engineers to the Auto Division alone. We feel, however, this new approach will help answer our peak engineering load problems."

Shipping Container Outlook Up

Manufacturers of steel shipping containers forecast a slight increase in business this year— notably in light gage drums, pails and packages. They see little change in heavy gage drums. The volume in light products last year is estimated to be 10 per cent better than it was in 1955. Heavy drums were up about 3 per cent.

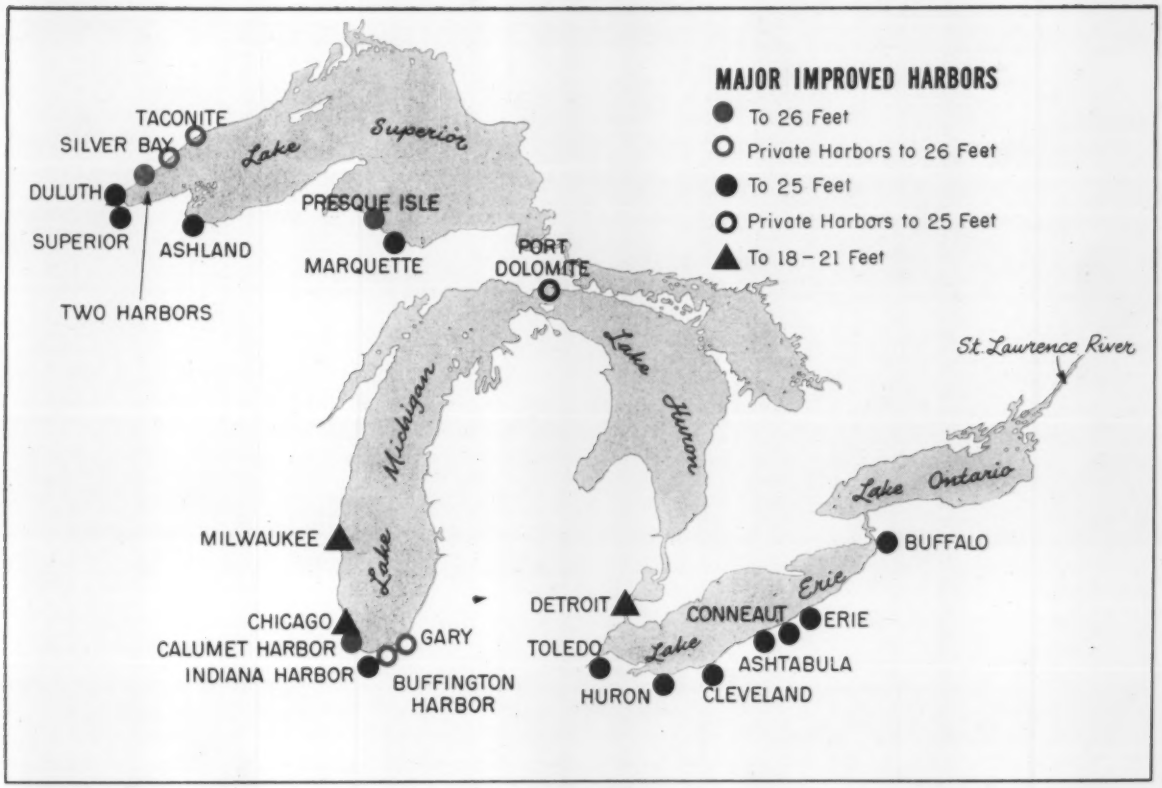
Livingston Keplinger, president, Steel Shipping Container Institute, says: "Light gage drums, small pails and packages are finding continuing growth in the industries they serve. In the heavy gage drums, military purchases are off. Offshore shipments of lubricants along the Atlantic Seaboard and Gulf have practically disappeared, but volume has been sustained by increased demand from the chemical, petrochemical and other industries."

The annual meeting of the institute (Apr. 23-25) will be at the Palm Beach-Biltmore hotel, Palm Beach, Fla.

Carpenter Steel Adds Land

Carpenter Steel Co. has acquired a long term lease on 60 acres of land adjoining its mill at Reading, Pa. This increases the total area controlled or owned by Carpenter about 50 per cent.

The company says that while immediate construction is not anticipated, the land is needed for long term growth.



Source: U. S. Army Corps of Engineers.

Ports Race Seaway

Here's a check list of seaway and port development problems sometimes obscured by promoters' enthusiasm. Port costs eventually will outdistance seaway expenses

THE SEAWAY is on schedule. Look for an early April, 1959, opening of facilities for 27-ft traffic, says the St. Lawrence Seaway Development Corp., Washington. Of course, unusual ice conditions in the river could change the date.

Note, however, that this prospect does not amount to "the fourth seacoast of the U.S.," so often described by seaway publicists.

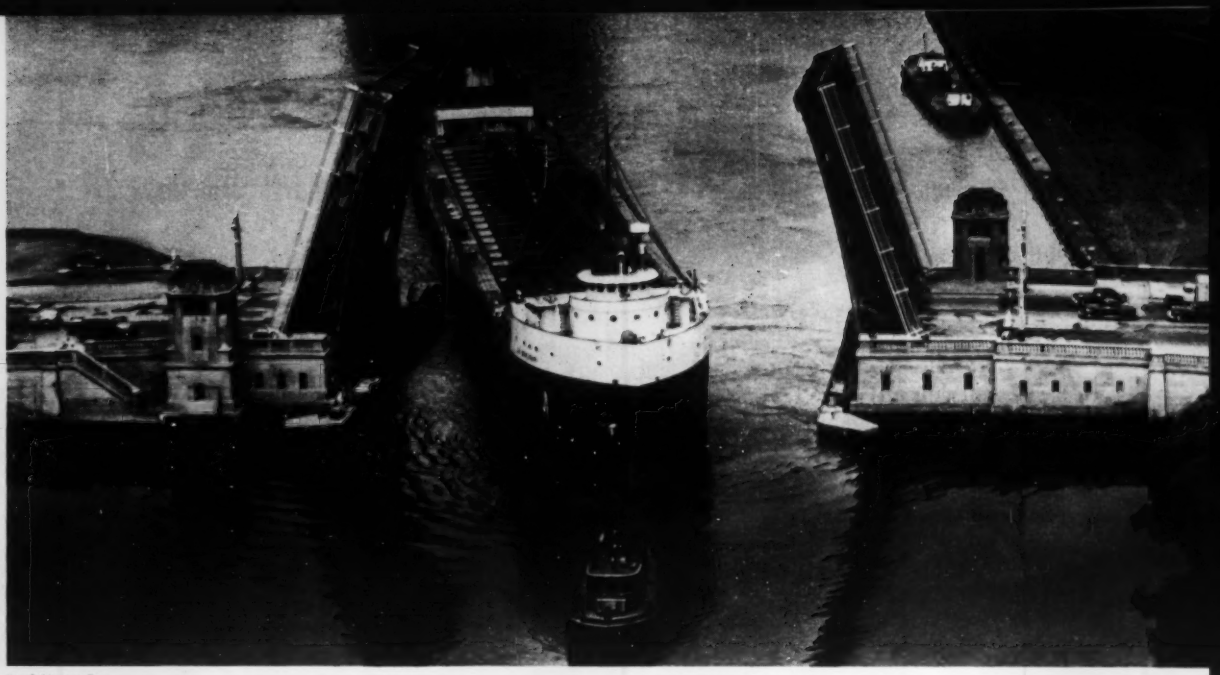
The Facts — Here's what will happen by 1959. Canada will deepen the Welland canal (connecting lakes Ontario and Erie) to 27 ft, and dredge 27-ft channels from St. Regis to Montreal. Seven new locks will be built in the Iroquois-Montreal area to raise ships from sea level to the 246-ft level of Lake Ontario. The two locks to be built by the U.S. will be finished in July, 1958, but the Canadian locks will hold back the opening of the seaway until 1959. The U.S. will also dredge 27-ft channels through the Thousand islands section of the St. Lawrence river. Congress appropriated $105 million for this country's part of the program.

That brings the seaway into Lake Erie. When will it come to the other Great Lakes? The target date is 1962.

Congress has authorized these connecting channels to be deepened to 27 ft at a cost of $150 million: St. Marys river, Straits of Mackinac, St. Clair river, Lake St. Clair and the Detroit river. Deepening of the St. Marys begins next spring.

Who's First? — Detroit may be the first major city to take advantage of the 27-ft seaway. Comments Gerald E. Warren, secretary, St. Lawrence seaway committee, Detroit Board of Commerce: "Five million dollars were appropriated in March, 1956, by Congress to start the Amherstburg channel link (Detroit river) in the connecting channels project. This link will be completed in 1960. Unlike other Great Lakes harbors, Detroit does not need any additional federal funds for approach channels to be assured of seaway traffic. This may give our port a three to five year advantage over other major ports on the lakes."

But Cleveland has a claim, too. Reports the city's department of port control: "The West Third street pier (under construction) is now dredged to 27 ft. We have requested the U.S. Army Corps of



Ford Motor Co.

Engineers to dredge an approach channel to 30 ft."

Toledo, O., guesses that it will be "among the first" to achieve the 27-ft depth.

The Hitch—It will take tight scheduling to meet the 1959 dead line. Hearings by the Corps of Engineers on projects to deepen Great Lakes harbors have just been completed in some cities (Cleveland for one), or are yet to come. A Corps of Engineers official estimates it will take nine months to get the necessary reports to Congress. Passage of the bills probably can't come before 1958; and it will be another six months before any money is appropriated. At the best, says this official, dredging will begin by the end of 1958.

It can be done faster: Ashtabula, O., did the job in a year. But that's the exception. With so many cities at the Corps of Engineers' door at one time, look for a slowdown in the legislative process.

Expectations — There are about 60 harbors on the lakes (including private harbors) with depths of at least 18 ft. Of these, 15 public harbors are 25 or 26 ft deep, and stand to gain the most from the seaway opening (see map).

The St. Lawrence Seaway Development Corp. says that general cargo ships of 8500 short-ton capacity will be able to come through the 27-ft channels—ships with a capacity of 1500 short tons now use the old 14-ft canal. The increase will be more startling in the case of bulk carriers: From ships with a capacity of 2500 short tons to those carrying 25,000 short tons.

The port cities are preparing facilities for this type trade. Some examples show the initial cost of this expansion:

Chicago—The first stage of the project to expand Lake Calumet harbor (costing $24 million) will be completed this year, reports Robert L. Bean, director, Chicago Association of Commerce & Industry. The project includes: A 100-ton capacity cargo crane for the harbor terminal; the construction of a 70-acre, 21-ft deep ship basin flanked by 5700 ft of docks; three transit sheds, one warehouse and two grain elevators. The docks are designed to allow further dredging to 27 ft.

The widening of the Calumet-Sag channel (from Lake Michigan to the Inland Waterway system) will be completed early in 1960.

Milwaukee—In 1958, a 20-acre landfill for harbor and terminal facilities will be completed. A $1.3-million passenger and automobile pier will be ready by 1959.

The principal feature of Milwaukee's port development is an ocean cargo terminal costing $5.7 million, says H. C. Brockel, municipal port director. To be 1100 ft long and 520 ft wide, it's scheduled for completion in 1960.

The city has recommended a program to the Corps of Engineers which will provide for "seaway draft channels."

Detroit—Three sites have tentatively been selected for development in a $70-million port expansion program (which has to be submitted to the Wayne county board of supervisors for approval): 1. A $50-million land fill project for warehouses and space to dock 14 ships. 2. A $3.5-million development on a 22-acre site to provide space for two ship berths. 3. The filling of Ecorse bay to add 17,000 ft of dock space.

Additional federal money may be sought to deepen the Trenton channel and the Rouge river.

Cleveland—Two cargo piers now in operation will be dredged to 27 ft by 1959. A 700-ft pier for West Sixth street is in the design stage. The Cuyahoga river will be widened to better handle increased bulk cargo traffic.

The piers are being paid for by the city. Warehouses will be constructed by private firms.

Among other requests to the Corps of Engineers, Cleveland has asked for two ships basins dredged to 27 ft.

Twin Ports — Superior, Wis., and Duluth boast the finest natural harbor on the lakes. Twenty-

Overseas Traffic Expected By Three Biggest Ports

(Exports and imports in net tons, excluding Canada)

	1965	1960	1555
Chicago	1,500,000	NA	213,895
Detroit	750,000-1,000,000	300,000	90,286
Cleveland	NA	200,000	47,947

NA=Not Available.

five million dollars will be spent for facilities on an 80-acre site in the outer harbor. Terminals will accommodate 11 of the largest-type ships to come through the seaway and more smaller ships.

"Corps of Engineers is considering deepening our harbor channels from their existing 25 ft to 27 ft. Other harbor improvements, such as extending the channel and providing additional anchorage space, have not been decided upon. The federal program should be completed by 1962," says Robert T. Smith, port director, Duluth.

Buffalo—Charles C. Fichtner, executive vice president, Chamber of Commerce, estimates $12 million will be needed to complete a Corps of Engineers' project to deepen Buffalo's harbor. He hopes the 27-ft depth will be ready for 1959.

The port authority is negotiating with Canada to use Peace bridge revenues for the expansion of harbor facilities.

Other Ports—Gary, Ind., whose harbors are privately owned, expects the Calumet-Sag channel to be extended to Gary. Huron, O., has requested the Corps of Engineers to deepen its entrance channels, enlarge and deepen the turning basin and lengthen its break wall. Kenosha, Wis., wants its harbor dredged to 24 ft; it hopes to buy land for 1000 ft of dock space.

Kewaunee, Wis., reports it's the most northerly port on Lake Michigan which is open the year around. It has asked for 22-ft channels and a larger turning basin. About $1 million may be spent by 1959 on dock sites and dredging. Marquette, Mich., has requested dredging. A municipal dock project will be started. Rogers City, Mich., says a federal harbor project is planned for Hammond bay, 16 miles northwest of the city.

Toledo, O., expects part of its federal project to be approved by Congress this year. It hopes to build an all-purpose terminal before the opening of the seaway.

Ashtabula's (O.) target date for a 27-ft channel is 1958. Another dock will be added to the city's harbor facilities. Ashtabula county expects $60-million worth of new construction in the next five years. The twin cities of St. Joseph and Benton Harbor, Mich., will soon have a 21-ft turning basin. The port commission has filed with the Corps of Engineers for a deep draft harbor "consistent with the seaway."

Conneaut, O., reports that a 27-ft channel waits approval by the Corps of Engineers. The city expects "significant increases by 1960 in shipments of coal, iron ore and other cargo." Escanaba, Mich., will have a new dock by 1958.

Consensus — Shipments through the seaway in 1959 may be less than some estimates made by promoters (see table), but the year will mark the beginning of a growth period for the Midwest.

The "fourth seacoast" is 10 to 15 years away. It will come as a natural result of this nation's booming economy as much as it will come from the seaway.

Some still shake heads over these two unsolved problems:

1. It takes at least 8 hours to get through the Welland canal. As yet, Canada has taken no action on the $100-million project to twin the locks. How much traffic will back up at the Welland before ship captains decide to try for other ports of entry to the U.S.?
2. One source estimates that about 90 per cent of the U.S.'s ocean-going ships and 60 per cent of foreign ocean ships will not be able to use the seaway because they have drafts over 25 ft, the maximum size ship which can negotiate a 27-ft channel.

Agitation has already begun for a 35-ft or even 40-ft seaway. Because the 27-ft channel has been some 30 years in coming, look for any new developments to be years away. Certainly the 27-ft variety must prove its value first.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, O.*

Defense's Machine Tool Costs To Be Revealed

THE Defense department's machine tool buying may set off some fireworks. It's likely that the Senate's Small Business Committee will supply the fire. Last year it asked Defense to break machine tool programs out of the budget and record them in a single report, but that was not done. The committee hopes to get some figures in a few weeks, but some Pentagon sources say it may have to wait until June when Congress hears appropriation requests. The Pentagon has always been cagey about the exact amount of its machine tool purchases. One estimate: $100 million in each of two fiscal periods—1954 and 1955.

Guesstimates: $400 Million a Year

When the figures do come out, they'll probably be well above the 1954-55 estimate. Sometimes mentioned: $200 million to $300 million. Defense's new replacement program adds another $150 million, to put the total at a possible $250 million to $450 million. The total figure involved is important to Congress because it will govern the meaning of Defense's program, which calls for an inventory replacement rate of 2 to 5 per cent per year. Incidentally, Congress criticized that rate: It would like to see it closer to 5 per cent, and will worry the Pentagon until a breakdown of the cost of Defense's machine tool buying is made. Defense pleads: The size of the budget makes breaking out specific figures a time consuming task.

U.S. Buyers Compete with Small Firms?

A Congressional committee is busy in another machine tool area. The charge: Government machine tool buying policies may be cutting some smaller firms out of tools that would cut costs for them. By buying the complete output of some types of high production, special purpose tools, then putting them into the plants of big prime contractors, Defense forces small firms to make do with what they have. The ability of small firms to compete is reduced accordingly. Still to be decided: Whether the problem is widespread enough for full-scale hearings.

Odds Favor More Money for Air Force

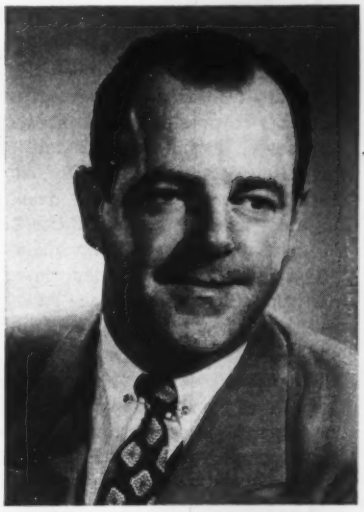
Watch for Congress to try to boost the Air Force budget above the asked for $17 billion. Strong administration forces could hold such efforts partly in check, but the odds are in favor of an increase: It may amount to more than last year's $100-million hike. Additional funds would be for long range jet bombers, aerial tankers and air bases. What the AF would really like: An increase in research and development funds.

Takes Aluminum Plates

Defense's take of heavy aluminum plates is on a sharp upturn. More aircraft parts are being made in one piece instead of being fabricated from many small pieces. There's some question about how long the trend will continue. Defense's material requirements for fiscal 1958 still aren't in. They were supposed to be ready last December, may not be ready until next December. Says Defense: Technological advances are requiring major changes in estimates.

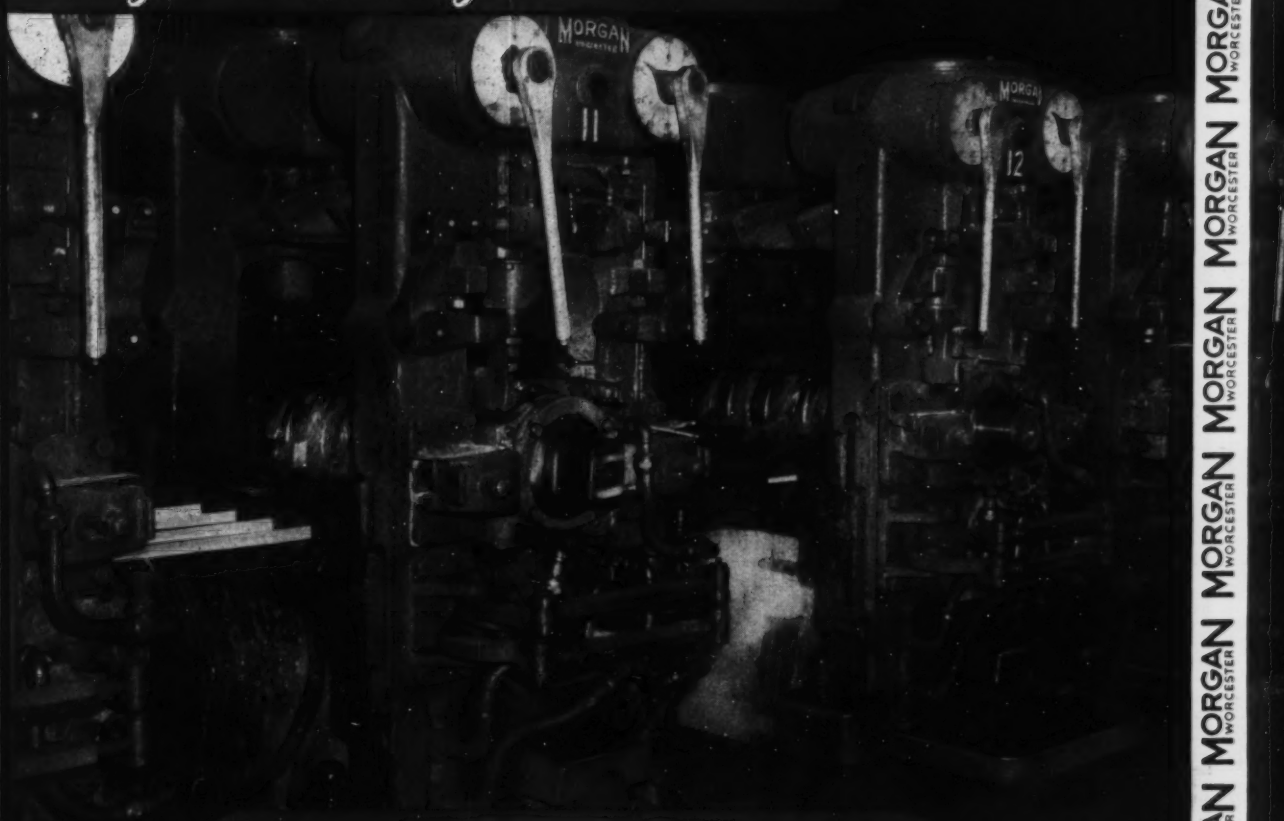
Straws in the Wind

- The Business & Defense Services Administration is asking warehouses to reject improperly filled-out orders for priority on steel, copper, aluminum and nickel bearing alloys.
- The availability of steel for the highway program probably will be checked again later this year, even though steel producers and users say careful scheduling and intelligent planning will provide enough.



Meet Stuart M. Jones: He's a consultant to Construction & Building Materials Division, Business & Defense Services Administration. Mr. Jones is vice president, New York Wire Cloth Co., York, Pa.

Morgan Quality in Action



MORGAN WORCESTER

High Speed Four Strand Rod Mill

Cuyahoga Works, American Steel and Wire Division

UNITED STATES STEEL CORPORATION

Morgan Mills are known to steel men throughout the world for their sound design and accurate manufacture . . . an enviable reputation which has assured mill users of efficient and trouble-free operation. Morgan Mills have kept pace with the ever-increasing demands for high output and greater accuracy of product.

MORGAN CONSTRUCTION CO.

WORCESTER, MASSACHUSETTS

ROLLING MILLS MORGOIL BEARINGS GAS PRODUCERS
WIRE MILLS EJECTORS REGENERATIVE FURNACE CONTROL

RSM-70

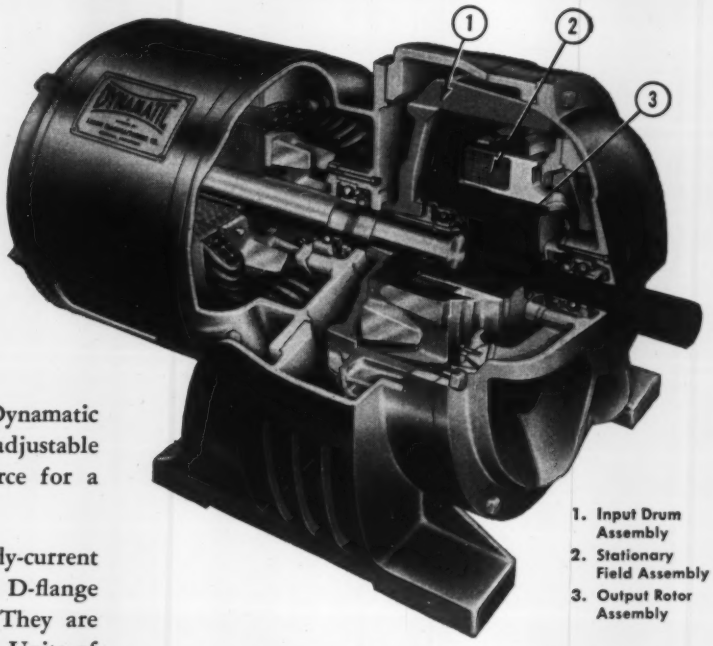
MORGAN WORCESTER MORGAN WORCESTER MORGAN WORCESTER

Infinitely Adjustable Speed from an AC Source with the NEW

EATON

DYNAMATIC®

Ajusto-Spede® Drives



1. Input Drum Assembly
2. Stationary Field Assembly
3. Output Rotor Assembly

The newly announced stationary field Dynamatic Ajusto-Spede® Drives provide stepless adjustable speed from an alternating current source for a wide range of industrial applications.

These air-cooled, stationary field eddy-current couplings are mounted integrally with D-flange open drip-proof squirrel cage motors. They are available in capacities from 3 to 75 HP. Units of the same design and capacities are also available without motors.

This new stationary field design eliminates the use of rotating coils, brushes, slip rings, and commutators, holding wear and maintenance to an absolute minimum. Dynamatic electronic or magnetic amplifier controls, in combination with these drives, provide wide latitude in operating functions.

Investigate these Important Ajusto-Spede® Drive Advantages:

Accurate speed control • Wide speed range
Low power losses • Simple construction
Rapid response • Low maintenance cost
Quiet, efficient operation • Remote control

Send for Illustrated Literature Describing these New Stationary Field Drives

EATON — DYNAMATIC DIVISION
MANUFACTURING COMPANY
3307 FOURTEENTH AVENUE • KENOSHA, WISCONSIN

George Meyer Upgrades Foremen

"YOU know the old army story: If you're a good man, your commanding officer will never let you go.

"Well, we have the opposite philosophy of management here at Warner & Swasey: We want to be known as a place where a man can go up as fast as he is able."

Expediter—George Meyer, general superintendent, Warner & Swasey Co., Cleveland, expedites that theory with the co-operation of the industrial relations department. He supervises 1400 men in Warner & Swasey's Cleveland plant, reporting to the works manager.

One of his major interests is a manpower development program for supervisors, which specifically provides for changes in assignments. Foremen and assistant foremen rotate shifts within their departments; and up to 20 per cent of them change departments each year. Benefits: New supervisors bring new approaches to department problems; supervisors gain confidence from their broader backgrounds.

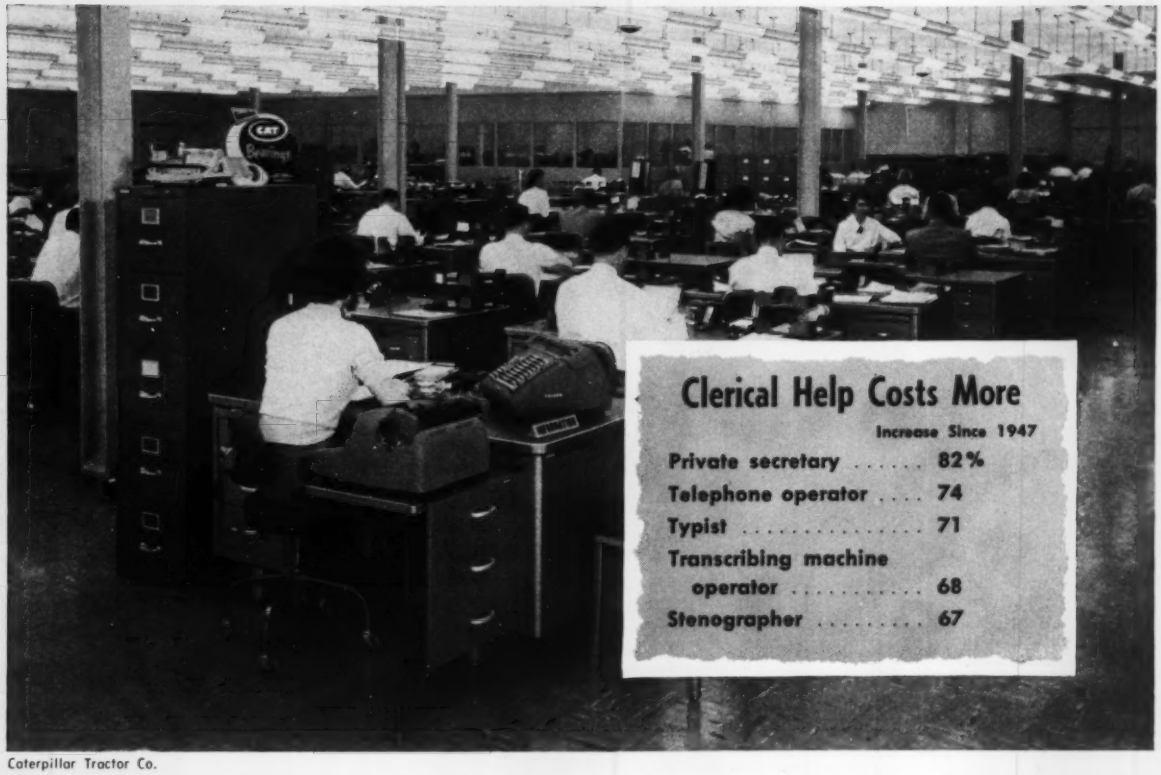
Idea Sessions—From their varied experiences, supervisors are better able to contribute to idea sessions run by Mr. Meyer or one of his superintendents. Several of these sessions each week take up production problems, personnel and company policies and goals.

"We want our foremen to think for themselves, not copy," comments Mr. Meyer. The idea sessions cultivate that atmosphere.

Each foreman is responsible for his own department. He formulates departmental policy within the framework of general company policy. "The foreman gets credit for unsuccessful ventures as well as successful ones. It proves he is thinking and looking for new approaches," concludes Mr. Meyer. The payoff: Production efficiency is up 25 per cent in three years.

Another result of Warner & Swasey's development program: Foremen are considered top candidates for nonshop management jobs because their backgrounds are so varied. They move into personnel, production scheduling, industrial engineering and other staff positions with a minimum of difficulty.

Well-Rounded—To help shop men develop the ability to think in the abstract, Mr. Meyer reports his foremen are encouraged to expand their civic and social contacts. One example: Last election, more than 30 of his 125 supervisors actively (and voluntarily) participated in the campaigns of both political parties.



Caterpillar Tractor Co.

Office Pay Goes Up

A study of nearly 430,000 clerical employees shows it is at an all-time high. The average rose $3 and hit $62 a week last year. Accounting clerks are the highest paid

THE GIRLS in your office should be wearing bigger smiles. The salaries of clerical office workers are shooting up at a brisk pace.

The average increase last year was $3 a week, $1 more than the average gain in 1955.

The National Office Management Association, Philadelphia, says the $2-a-week average increase held good for four straight years, from 1947 through 1950. In 1951 and 1952, it was $3. The $4 boost in 1953 was followed by one of only $1 in 1954.

Statistics—For this year's survey, over 6000 companies of all types and sizes provided information on 24 basic clerical jobs.

The highest pay, the survey found, went to the accounting clerk (senior bookkeeper). Next are private secretaries and cost clerks. Messengers were paid the least.

Salaries and job rankings vary from city to city and area to area. Highest salaries are found in the east central and western sections of the country. In one city, they have doubled in the last ten years.

More Than Pay—The 40-hour week is slowly being trimmed, although 64 per cent still had it in 1956. In 1948, the figure was 71 per cent.

The short week has arrived for Canadian office workers (about 10 per cent of the cities covered are Canadian). Almost 75 per cent of the Canadian companies work less than 40 hours.

There is a trend to more paid holidays. The line was held at six holidays by 34 per cent of U.S. companies. Seven were paid by 23 per cent. Eight or more were paid by 35 per cent.

Canadian Plant Enlarged

Canadian Allis-Chalmers Ltd., Montreal, expects to complete a 17,000 sq-ft addition to its St. Thomas, Ont., works by March. The company is a subsidiary of Allis-Chalmers Mfg. Co., Milwaukee.

Canadian Firm Triples

G. W. King of Canada Ltd., Hamilton, Ont., a maker of material handling equipment, has nearly completed an expansion program which will more than triple its manufacturing space.

Ford Expands in Canada

A $1-million parts and accessories depot will be built in Toronto, Ont., by Ford of Canada.

Forecast for Canada—

Steel company chief predicts 100 per cent production increase by 1980, population rise to 26 million; 1956 production up 53 per cent over 1950's

STEEL PRODUCTION of 11.8 million tons and a population of 26 million were predicted for Canada by 1980 in a report to the Royal Commission by H. G. Hilton, president of Steel Co. of Canada Ltd. Mr. Hilton forecast an outlay of $9.9 billion (Canadian dollars) by the steel industry during this period, not including plant replacement.

Rapid expansion of the Canadian steel industry since World War II saw an all-time record production last year of 5.2 million tons, an increase of 53 per cent over 1950's. However, increasing population (currently estimated at 16 million), the St. Lawrence Seaway and expanding industry consumed 30 per cent more steel than was produced in Canada in 1956.

Good Market—Most of this, 1.4 million tons, came from the U.S., making Canada the largest single export market for steel produced in the U.S. The products: Chiefly structurals, sheets, pipes and plates.

Likewise, the U.S. was the largest single export market for Canadian steel, receiving 30,000 tons of the 160,000 tons exported last year.

Canada exports steel when she cannot meet domestic demands for three reasons: 1. The geographical location of raw materials. 2. The ease of shipping (rail and water). 3. The closeness of business and industrial activities of the two countries.

Close to U.S.—Nearly 75 per cent of Canada's production capacity is near the U.S. border in the Great Lakes region. Canadian interests own ore deposits in the U.S., and it is cheaper to ship across the line than from northern Quebec and Labrador. Completion of the St. Lawrence Seaway is expected to reduce Canada's dependence on imported ore.

Canada's growing population (70 per cent increase since 1925), rising living standard and the impetus of two world wars have combined to make it one of the leading industrial nations of the world.

History — In 1872, the Nova Scotia Forge Co. erected a plant at New Glasgow, Nova Scotia. It is considered to be the beginning of the Canadian steel industry, which spread southward with the discovery of coal and iron ore.

Today, there are 28 companies, including subsidiaries. Four fully integrated mills form the core of the industry and comprise 92 per cent of ingot capacity. The other companies manufacture finished products from semifinished steel. In order of their capacity the four integrated mills are:

Steel Co. of Canada Ltd., Hamilton, Ont.; Algoma Steel Corp. Ltd., Sault Ste. Marie, Ont.; Dominion Steel & Coal Corp. Ltd., Sydney, Nova Scotia; Dominion Foundries & Steel Ltd., Hamilton.

Hamilton Is Center—More than 50 per cent of the ingot capacity is near Hamilton, including two of the integrated mills. Sault Ste. Marie is next with 24 per cent of the steel and 36 per cent of the pig iron capacity.

Since 1941, the Canadian steel industry has spent $424 million (Canadian) on modernization and expansion, including the installation of the Austrian developed oxygen-lance process in 1954—a first on this continent.

Atlas Steels Ltd., Welland, Ont., has added a continuous casting machine and a new planetary (Sendzimir) hot-strip mill for rolling stainless steel. Dominion Foundries & Steel Ltd. is doubling its oxygen steelmaking capacity with another blast furnace.

Page-Hersey Tubes Ltd., in conjunction with Steel Co. of Canada, is building a $10-million large diameter electricweld pipe mill at Welland. Other firms are engaged in similar expansion and modernization programs.

Future Assured — Canada's future as a major world ore producer is assured by reserves of an estimated 3 billion tons of high grade ore and extensive deposits of low grade ore which will be in more demand as new processes of beneficiation are developed.

More than 17 million tons of ore were produced last year, and it is predicted that this will be stepped up to 40 million tons within the next ten years. Despite the current high output, nearly 3 tons of imported ore for every ton of domestic were used last year.

Canadian Ore for U.S. Steel

The largest Canadian iron ore development in five years is set to begin this spring when Cartier Mining, U.S. Steel Corp. subsidiary, starts a $200 million project near Shelter Bay, 300 miles northeast of Quebec City.

Province Premier Maurice L. Duplessis, who termed the undertaking "colossal," said the construction schedule calls for completion by 1961. He said large iron ore concentration plants on the site will produce 30 per cent pellets from low-grade deposits.

Shipping facilities will be built at Shelter Bay, on the St. Lawrence river, Mr. Duplessis added, as well as a 150-mile railway and a hydroelectric power plant on the Hart Jaune river.

U.S.-Canadian Trade in Finished Steel

(Thousands of net tons)

	1956*	1955	1950	1946	1937
From U.S. to Canada	1400	760	645	602	350
From Canada to U.S.	30	40	29	8	5

*Estimated. Source: Dominion Bureau of Statistics, Trade of Canada.

ONE OF A SERIES . . .

What makes Hyatts run smoother and longer?

CARBURIZED INNER RACES

From a fatigue life standpoint, the inner race is the critical member of a roller bearing, because the smaller area of contact between rollers and inner race concentrates the loads upon it. That's why HYATT goes to the added expense of *carburizing* every inner race—to assure you the performance and fitting advantages detailed at the right.

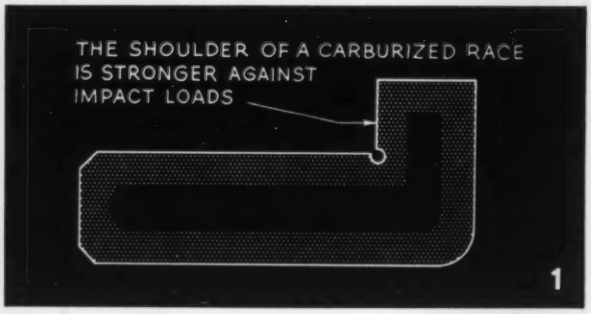
You will find full selection and application data in HYATT Catalog 150, or call your nearest HYATT Sales Engineer. Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey. Sales offices at Harrison, Pittsburgh, Detroit, Chicago and Oakland, Cal.

HEAVIER INTERFERENCE FITS

Resistance to relative movement between inner race and shaft is vital to good performance. So HYATT makes practically all inner races of carburizing type nickel alloys instead of through-hardened steel. After carburizing and heat-treating, the outer surface has the hard wear resistance so necessary for an efficient bearing. The low-carbon core remains tough and ductile to permit much heavier interference fits than are otherwise possible.

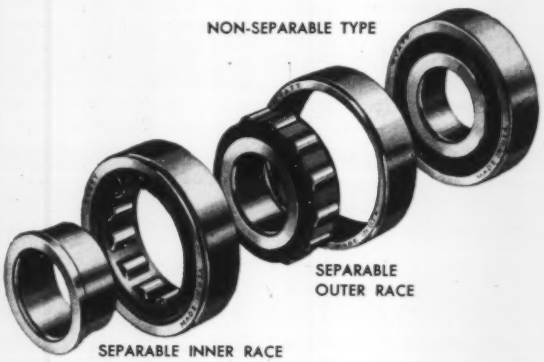
TOUGHER FLANGES, GREATER LOAD CAPACITY

Carburizing also enables HYATT to obtain substantially tougher inner race flanges. Tests show the shoulders will withstand considerably greater impact loads (Figure 1). The carburizing process has also been found to increase the load-carrying capacity of the race by building up compressive hoop stresses in its external fibres during quenching.



SIMPLER, LOWER-COST MOUNTING

Another advantage of HYATT'S heavier interference fits is the elimination of all auxiliary holding devices. When the carburized inner race is either pressed or shrunk on the shaft according to HYATT fitting recommendations, it becomes practically an integral part of the shaft itself. This permits mountings of the simplest type and lowest overall cost.



GM GENERAL MOTORS

HYATT HY-ROLL BEARINGS FOR MODERN INDUSTRY

Truck Forum Sees Good Year

National conference points up hauling problems, service strengths and projects future output. The industry may sell 1.15 million units this year. Ford previews 1957 line

DOMESTIC truck sales should hit about 960,000 units this year, says D. W. Lee, truck planning manager, Ford Motor Co.

Total industry sales should equal 1.15 million. Rundown: Light trucks, up 6 per cent; heavy duties, up 5 per cent; and mediums, up about 1 per cent. By 1960, the industry should produce 1.35 million trucks annually, he adds.

Ford's sales outlook for the industry came out at the National Truck Conference sponsored by the company at its Dearborn, Mich., rotunda.

Some of the points discussed serve as references for other industrialists who depend on trucks in their own businesses.

Growth — "Industries moving into the South have found that trucking service is so excellent that a rail siding is no longer a requisite for plant location," claims C. J. Williams, chairman of the American Trucking Association.

A recent ATA study of the Asheville, N. C., region shows that 19 out of 23 newly founded factories ship 77 per cent of all finished goods by truck and receive 76 per cent of their raw materials the same way.

Heavy Hauler—Mr. Williams explains there are 10 million trucks in America. "Taxes (on them) will pay for 40 per cent of the superhighway program."

Emphasis on over-the-highway hauling highlights trouble spots for companies that ship by truck. Carter A. Justin, vice president and sales director of Kramer Bros. Freight Lines Inc., Detroit, says that terminal point costs have risen much faster than those of over-the-road operation.

Closer attention to dispatching, better freight checking and loading methods and more automatic loading devices will save money for truck using firms, he says.

Credit — Financing new truck fleets can be a tough job for some companies. Tight credit restrictions make it even more difficult today. "No really legitimate and sound truck financing is ever likely to be denied," reports Dr. Sidney E. Rolfe, chief economist for C.I.T. Financial Corp., New York.

But he warns that trucks will have to compete with the much larger automobile financing market for a share of available credit. Dr. Rolfe points out that $600 million worth of credit was used to finance one-fourth of all trucks sold in the U.S. last year.

Probably an equal or slightly greater amount will be used this year.

Designs — The speakers agreed that better designed and better built trucks have been a major factor in boosting highway transportation. This served as an opportunity for Ford to introduce its 1957 models.

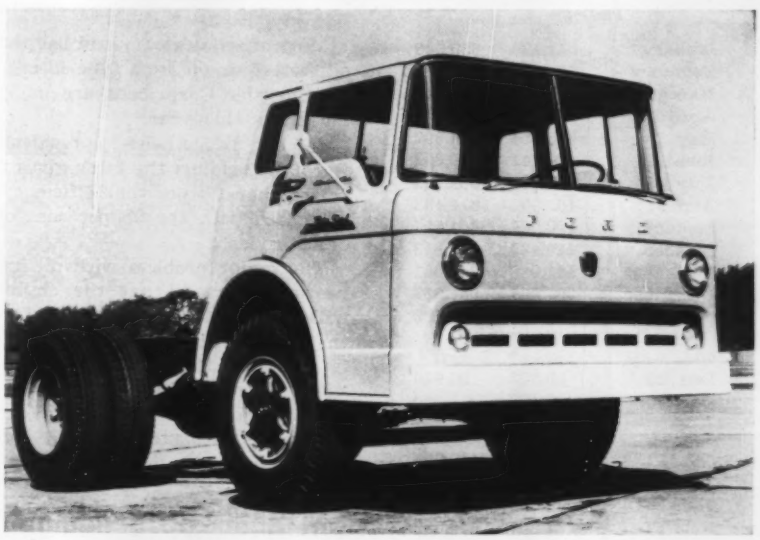
The presentations indicate that Ford is laying the groundwork for capturing a bigger percentage of the truck market in coming years. Emphasis will be in light and heavy duty trucks.

Prospects—In 1957, the company expects to increase its share of the truck market from 30 to 34 per cent, says Robert S. McNamara, Ford vice president and Ford Division general manager.

L. A. Iacocca, Ford's truck marketing manager, dropped a competitive hint, stating that market research reveals 42 per cent of truck buyers tend to repurchase the same make. The company plans an advertising campaign which it hopes will lower these odds.

Strong Points — The biggest sales advantage lies in the trucks themselves. This is the first major change Ford has scheduled in its truck lines since 1953. Tooling and engineering cost $77 million.

Original introduction was for 1958, but Mr. McNamara says the company spent an additional $5 million to bring out the line this



Ford's new tilt-cab units come in six series, available Feb. 1

(Material in this department is protected by copyright, and its use in any form without permission is prohibited.)

year. Two of the models, plus an automatic transmission, seem to offer most sales potential.

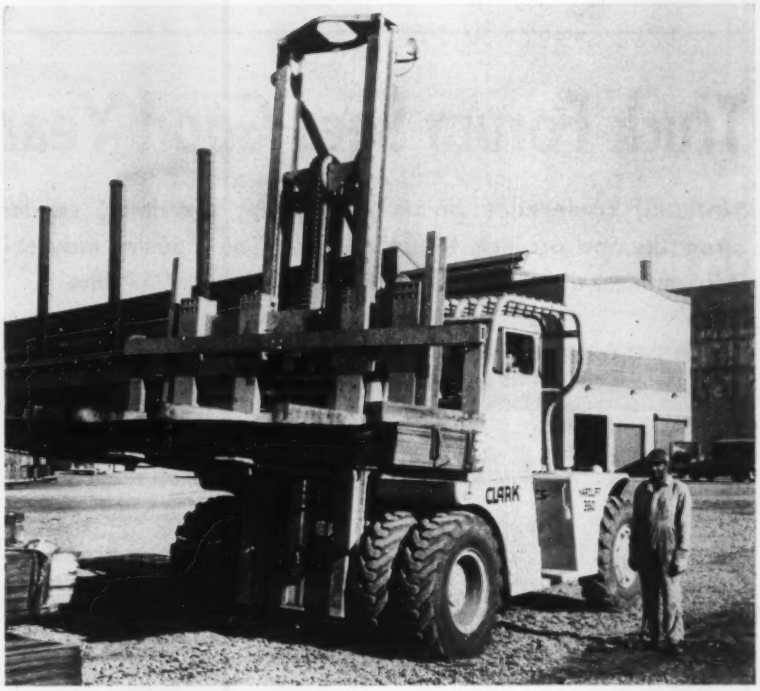
Tilt Cab—Heavier pay loads are a feature of Ford's Tilt Cab series. By placing more of the vehicle weight on the front axle, an extra 1100 lb of freight can be carried.

The tilt cabs come in six series with gross vehicle weights of 18,000 to 30,000 lb and four wheelbase ranges—from 99 to 153 in. The 80.3-in. cab makes for a shorter turning radius.

Tilt cab trucks will compete with earlier versions developed by White Motor Co., Cleveland, and International Harvester Co., Chicago.

Ranchero—Ford's half car-half pickup truck is programmed at 25,000 units this year. It's built on a 116-in. wheelbase, with a station wagon chassis. Cargo capacity is 30.4 cu ft. The Ranchero carries an 1190-lb pay load (see STEEL, Dec. 31, 1956, p. 48).

Even though it won't be available until May, Ford's Transmatic transmission should sell well in medium and some heavy duty models. It also is available for extra heavy duty trucks.



Ford Adapts Lift Truck for Frame Plant Use

A quick-change fork adapter placed on the fork carriage of this 35,000-lb capacity lift truck enables it to carry two 16,000-lb bundles of sheet steel. Without the adapter, the truck can pick up two coils of steel at a time with hydraulically adjusted main forks. The truck is used at Ford's Dearborn frame plant

Filter Adds Engine Life

Cylinder wear tests using Chrysler's dry type air filter show erosion after 100 miles was 0.00028 in., compared with 0.030 in. using standard filters.

The Micronic filter has a life expectancy of about 10,000 miles under normal conditions, says its maker, Purolator Products Inc., Rahway, N. J.

Most of today's cars still use the oil wetted or oil bath type filter—all Chrysler Corp. cars are using air filters this year.

James D. Abeles, president, Purolator, claims the filter gives a better than 99 per cent efficiency, compared with the 95 per cent of older styles.

The major problem with oil immersed filters is that the engine will continue to operate even after the filter has become so clogged it is useless. Reports Mr. Abeles: "The Micronic filter has no bypass method built into it. When it becomes saturated, it won't permit engine operation."

U.S. Auto Output

	Passenger Only 1956	1955
January	611,190	659,508
February	554,667	675,495
March	575,559	794,015
April	547,766	753,851
May	471,994	724,892
June	430,141	649,393
July	448,804	659,763
August	401,997	614,493
September	190,709	461,591
October	388,922	517,813
November	581,088	749,061
December	597,083	682,257
Totals	5,799,920	7,942,132

Week Ended	1956	1955
Dec. 29	99,577	105,670
	1957	**1956**
Jan. 5	91,130	125,245
Jan. 12	147,129	149,995
Jan. 19	145,761	144,729
Jan. 26	146,595†	135,586
Feb. 2	147,000*	140,582

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

GM Holds Up Building

General Motors Corp. has confirmed reports that it's holding up construction of a Buick-Oldsmobile-Pontiac assembly plant in Sunnyvale, Calif., and a Chevrolet assembly plant in Lordstown, O.

Harlow H. Curtice, president, says early completion dates have been delayed so further studies can be made. The Ohio facility was to start production this fall; the Sunnyvale assembly line aimed at 1959 model output.

Mr. Curtice asserts, "Other projects are being carried forward toward completion . . . Our total 1957 expenditures for facilities and tooling should approximate $1.25 billion."

Exhaust Notes

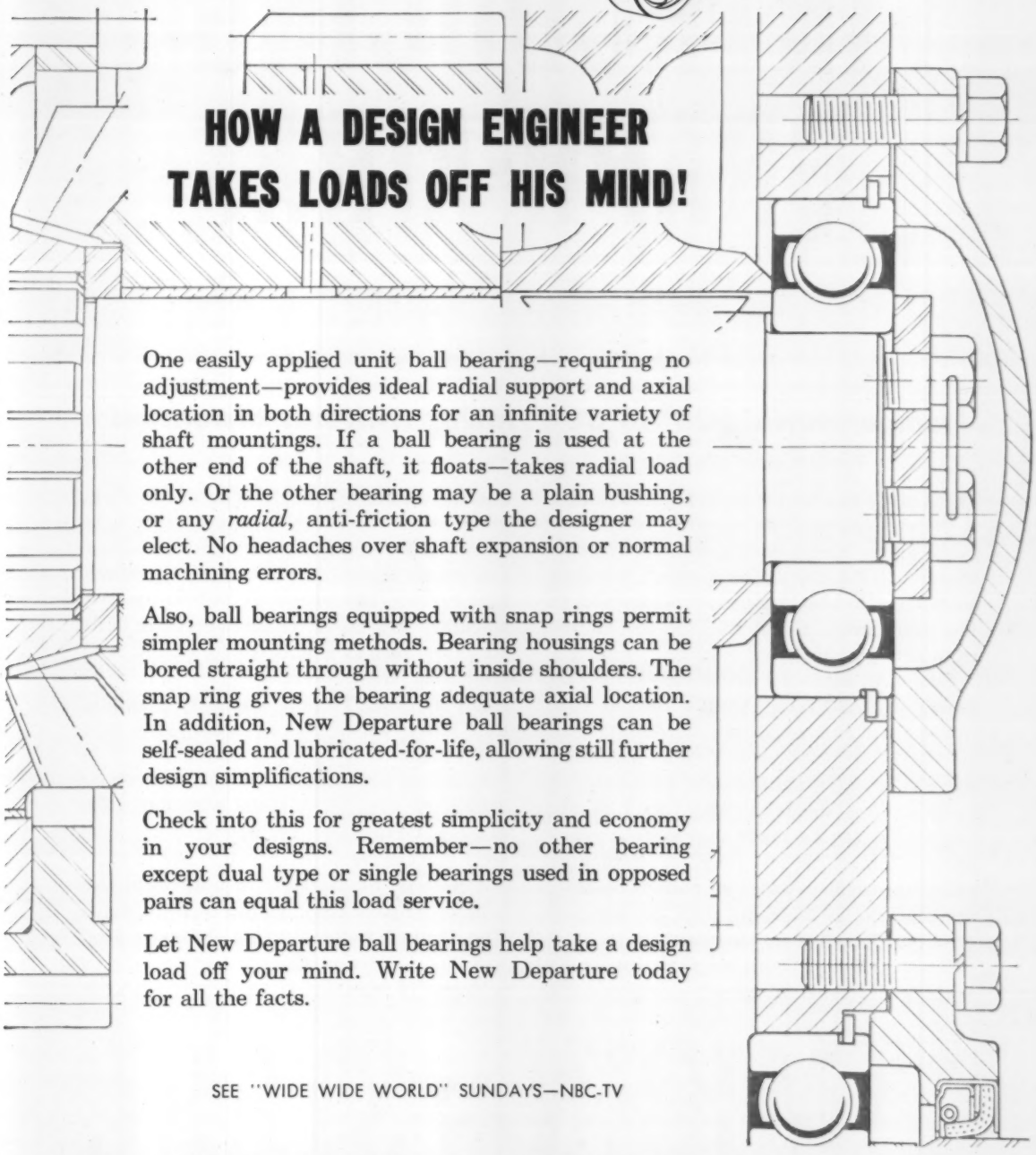
• Studebaker-Packard Corp. reports that 65 per cent of its January orders call for S-P's twin traction differential.

• Chevrolet confesses that 1956 was second only to 1950 in total retail deliveries. Some 1.6 million Chevrolets were delivered, compared with 1.4 million units in 1950, the previous top year.

FACTS

about

NEW DEPARTURE BALL BEARINGS



HOW A DESIGN ENGINEER TAKES LOADS OFF HIS MIND!

One easily applied unit ball bearing—requiring no adjustment—provides ideal radial support and axial location in both directions for an infinite variety of shaft mountings. If a ball bearing is used at the other end of the shaft, it floats—takes radial load only. Or the other bearing may be a plain bushing, or any *radial*, anti-friction type the designer may elect. No headaches over shaft expansion or normal machining errors.

Also, ball bearings equipped with snap rings permit simpler mounting methods. Bearing housings can be bored straight through without inside shoulders. The snap ring gives the bearing adequate axial location. In addition, New Departure ball bearings can be self-sealed and lubricated-for-life, allowing still further design simplifications.

Check into this for greatest simplicity and economy in your designs. Remember—no other bearing except dual type or single bearings used in opposed pairs can equal this load service.

Let New Departure ball bearings help take a design load off your mind. Write New Departure today for all the facts.

SEE "WIDE WIDE WORLD" SUNDAYS—NBC-TV

BALL BEARINGS MAKE GOOD PRODUCTS BETTER

NEW DEPARTURE • DIVISION OF GENERAL MOTORS • BRISTOL, CONN.

INTRODUCING GRAPH-AIR...

a tougher, more versatile graphitic tool steel that air-hardens at temperatures 200° to 300° lower with less distortion!

NO facilities for oil-quenching—or other relatively costly heat treating processes? Need a finer air-hardening tool steel? Then specify *Graph-Air,* newest steel resulting from the Timken Company's pioneering in fine alloy steels. Latest addition to our line of quality graphitic tool steels!

Graph-Air tool steel air-hardens at temperatures of 1450°F to 1550°F—200° to 300° lower than most other air-hardening tool steels. And because Graph-Air *is* air-hardened, there's less distortion, easier heat treating control, less decarburizing. As a result, Graph-Air can be made into *more intricate sections.* Graph-Air is a tough air-hardening steel, too—made to order for such demanding applications as blanking dies, or any tool steel part which must take hard abuse.

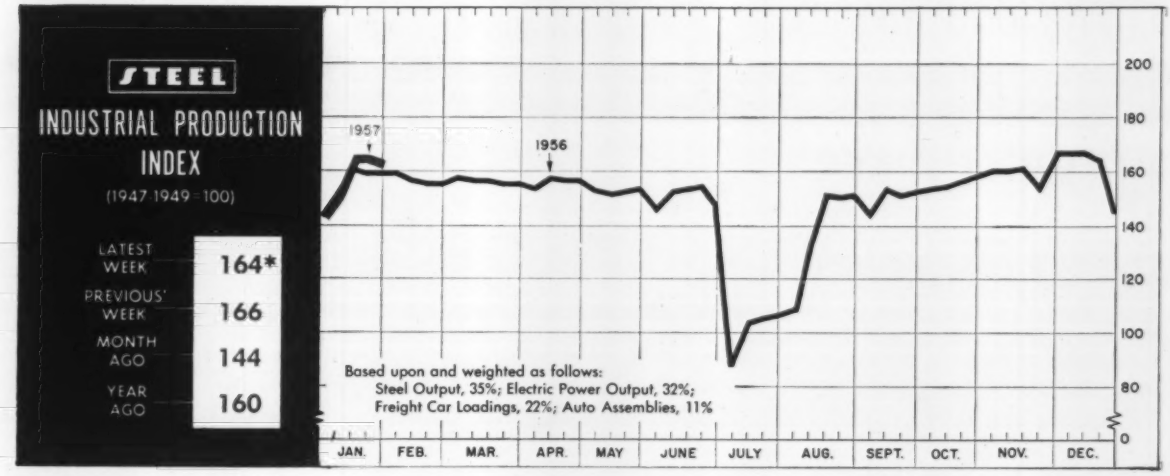
Besides all the advantages of air-hardening—economy, less drastic reactions to quenching, less tendency to scale—Graph-Air offers greater wear, machinability and stability. Like Graph-Mo, Graph-Air will outwear other tool steels, because of the uniform diamond-hard carbides in its structure. And Graph-Air machines 30% faster. The free graphite in its structure acts as a built-in lubricant. And Graph-Air stays *accurate longer,* is fully as stable as other Timken Company graphitic tool steels, which are the most stable tool steels made!

Growing out of the Timken Company metallurgists' long experience with fine steel making, Graph-Air—the *new* graphitic tool steel that can be air-hardened at *low* temperatures—will be available in both solid and hollow bar sizes. For more information, write: The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

TIMKEN *Fine Alloy* STEEL

TRADE-MARK REG. U. S. PAT. OFF.

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS STEEL TUBING



*Week ended Jan. 26.

New Orders Assure Continued Good Business

NEW ORDERS belie the much-publicized reports of a downturn in business. They are showing strength which will keep manufacturers busy for many months.

There has been a flurry of reports that this or that industry is "hurting" because of a decrease in net new orders. Most of them cover November and December and are not adjusted for seasonal factors. Weather, holidays, elections and other year-end activities usually influence these months.

Updating—Now come scattered reports for January, such as that of the business survey committee of the National Association of Purchasing Agents, who are optimistic about 1957. Thirty-two per cent of the respondents to this survey say that new orders improved over those of the previous month, compared with only 24 per cent so reporting in December. Of perhaps more significance is the fact that only 23 per cent report a decline. That's down 8 percentage points from the last report of 1956, indicating that any downtrend has been reversed.

Another survey, from Dun & Bradstreet Inc.—taken in early January—shows that almost two-thirds of the 1535 businessmen questioned expect sales in the second quarter to be higher than those in the corresponding period of 1956, both in dollar value and units.

Time Will Tell—This does not mean that we can all sit back and stop worrying. Some capital equipment makers had business declines during the late months last year (see page 59 and charts, page 78). Taken by themselves, they might be depressing factors. But one month doesn't establish a business trend. Nor does one industry set the pattern for the whole economy. While stampings or screw machine products were down, others, such as gears, were up. The American Gear Manufacturers Association says its index advanced to 235.7 (1947-1949=100) in December.

Despite these declines reported for November, the seasonally adjusted total figure for new orders

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,485[1]	2,472	2,444
Electric Power Distributed (million kw-hr)	12,300[1]	12,556	11,512
Bituminous Coal Output (1000 tons)	9,875[1]	10,360	10,540
Petroleum Production (daily avg—1000 bbl)	7,450[1]	7,431	6,974
Construction Volume (*ENR*—millions)	$222.1	$335.0	$362.3
Auto, Truck Output, U. S., Canada (*Ward's*)	179,306[1]	177,778	169,263
TRADE			
Freight Car Loadings (1000 cars)	650[1]	657	692
Business Failures (Dun & Bradstreet)	278	256	269
Currency in Circulation (millions)[3]	$30,827	$31,108	$30,361
Dept. Store Sales (changes from year ago)[3]	+2%	+3%	+3%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$23,573	$22,763	$22,164
Federal Gross Debt (billions)	$276.2	$276.0	$280.3
Bond Volume, NYSE (millions)	$20.3	$23.0	$24.3
Stocks Sales, NYSE (thousands of shares)	10,498	11,504	10,613
Loans and Investments (billions)[4]	$86.5	$86.2	$85.5
U. S. Govt. Obligations Held (billions)[4]	$26.8	$26.3	$29.5
PRICES			
STEEL's Finished Steel Price Index[5]	225.92	225.92	209.10
STEEL's Nonferrous Metal Price Index[6]	252.3	251.9	269.7
All Commodities[7]	117.0	116.7	111.7
Commodities Other Than Farm & Foods[7]	125.2	124.9	119.8

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1957, 2,559,490; 1956, 2,461,893. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

You can cut your GLOVE COSTS

with the authorized

JOMAC COST-REDUCTION PLAN

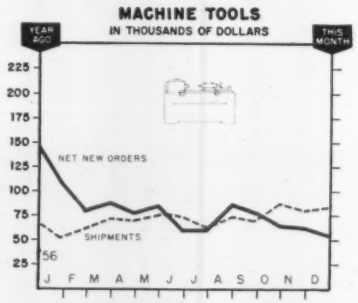
send for this free booklet

It contains dollars-and-cents proof that glove costs can be reduced. Write today to Jomac Inc., Dept. E, Phila. 38, Pa., and ask for "Evidence" booklet.

JOMAC
INDUSTRIAL GLOVES

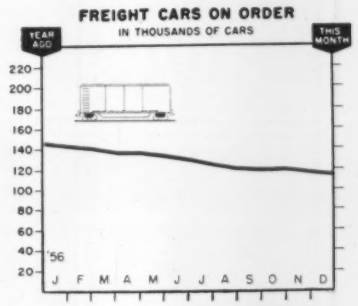
Plants in Philadelphia, Pa., and Warsaw, Ind.
In Canada: Safety Supply Company, Toronto

THE BUSINESS TREND



	New Orders		Shipments	
	1956	1955	1956	1955
Jan.	109,550	57,650	54,600	49,500
Feb.	81,300	58,000	64,600	49,750
Mar.	89,500	60,650	74,150	59,900
Apr.	79,300	50,250	71,800	53,250
May	87,100	68,700	76,800	53,500
June	61,850	74,550	76,250	58,800
July	61,900	62,200	65,150	45,200
Aug.	87,500	62,050	75,100	48,650
Sept.	78,450	58,350	71,100	57,800
Oct.	66,100	99,150	89,750	60,400
Nov.	64,250	124,250	81,700	63,350
Dec.	57,100*	151,300	85,350*	70,300
Totals	923,900*	927,100	886,350*	670,400

*Preliminary.
National Machine Tool Builders' Assn.



	Awards		Backlog (end of month)	
	1956	1955	1956	1955
Jan.	1,818	5,087	144,946	18,395
Feb.	1,675	2,690	141,437	18,633
Mar.	1,618	2,156	137,070	17,974
Apr.	6,559	2,706	137,436	17,930
May	2,403	3,041	133,072	16,886
June	2,859	13,365	129,409	27,102
July	2,642	18,007	126,194	42,888
Aug.	2,575	13,405	122,870	52,803
Sept.	3,949	3,228	122,421	52,913
Oct.	6,532	12,843	122,250	61,954
Nov.	4,172	51,066	119,626	109,370
Dec.	4,992	42,278	117,320	147,320
Totals	41,794	169,872		

American Railway Car Institute.

Charts copyright, 1957, STEEL.

in durable goods industries was up 2 per cent over October, according to the Commerce department. While advances in primary metals and transportation were primarily responsible, the level of new business in other fields was comparable to that of October. And new orders as a whole are still running ahead of shipments, resulting in a rise in backlogs. At last report, there was enough unfinished business to keep industry going full blast for four months.

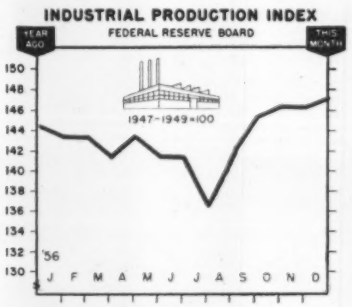
Index Remains High

STEEL's industrial production index certainly gives no indication of a downturn in business. During the week ended Jan. 26, it registered 164 per cent of the 1947-1949 average, 4 percentage points above the mark a year ago. In the last three weeks, the two most stable elements of the index have been steel production and auto output.

Steel mills have eased off only slightly since setting the weekly production record of 2,525,000 net tons for ingots and castings in December. Accounting for 35 per cent of the composite, this element has varied only about 1 point for several months, with the exception of the Christmas week. With mills booked heavily for the first quarter and well into the second, steel production will continue to be the main strength of industrial production.

Auto producers apparently have found 167,000 to be their magic number. They produced approximately that many cars and trucks for three weeks running up to Jan. 26, and there has been no change in the schedules for February. Motordom is avoiding any sudden build-up in dealers' stocks this year by keeping a close eye on the sales figures and scheduling accordingly. There is plenty of evidence that 1957 models are meeting with buyers' approval in everything but price. Even so, last month looks like it was the second best January on record. Even medium-price cars, which had been the main drag on the market, showed some signs of picking up, according to *Ward's Automotive Reports*. A few over 100,000 new cars went into inventory, about normal for this time of year.

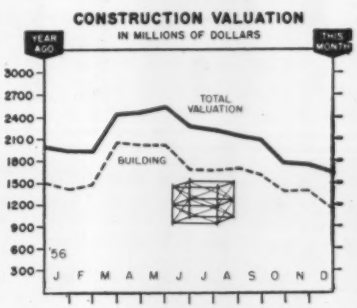
The weakest element of the index is railroad loading of freight cars for revenue. For the first three weeks of 1957, loadings are about 6 per cent behind those of



(Seasonally adjusted)

	Total Production		Primary Metals		Metal Fabricating	
	1956	1955	1956	1955	1956	1955
Jan.	143	132	148	127	170	157
Feb.	143	133	148	131	168	157
Mar.	141	135	145	136	166	160
Apr.	143	136	145	138	171	160
May	141	138	141	140	167	163
June	141	139	135	143	168	164
July	136	139	68	134	169	166
Aug.	142	140	124	139	173	168
Sept.	145	142	148	146	176	171
Oct.	146	143	147	148	177	173
Nov.	146	143	147	149	180	172
Dec.	147*	144	149*	150	181*	172
Avg.	143*	139	137*	140	172*	165

Federal Reserve Board. *Preliminary.



	Total		Building	
	1956	1955	1956	1955
Jan.	1,858.2	1,504.5	1,355.7	1,255.1
Feb.	1,859.7	1,581.1	1,429.3	1,278.6
Mar.	2,381.9	2,134.8	1,986.5	1,748.6
Apr.	2,421.5	2,322.1	1,965.7	1,776.1
May	2,479.8	2,185.1	1,948.7	1,737.1
June	2,197.8	2,255.2	1,620.5	1,793.7
July	2,148.6	2,271.5	1,605.3	1,851.6
Aug.	2,068.8	1,894.8	1,621.0	1,516.9
Sept.	2,024.8	2,034.9	1,539.7	1,442.2
Oct.	1,706.4	1,862.7	1,331.9	1,474.8
Nov.	1,689.3	1,796.8	1,354.4	1,388.3
Dec.	1,575.9	1,920.8	1,073.9	1,438.0
Totals	24,312.7	23,764.3	18,832.6	18,701.0

F. W. Dodge Corp.

the corresponding period of 1956.

Record Electric Output

The most dynamic force at work on the index is electric power output. After setting an all-time high of 12.327 billion kw-hr during the week ended Jan. 12, the industry came back the next week and broke the record with 12.556 billion kw-hr, reports Edison Electric Institute. Residential, commercial and industrial customers used more electricity to keep warm as the cold wave continued its grip on much of the nation. With more cold weather and even greater consumption by industry due this month, prospects are good that record will fall.

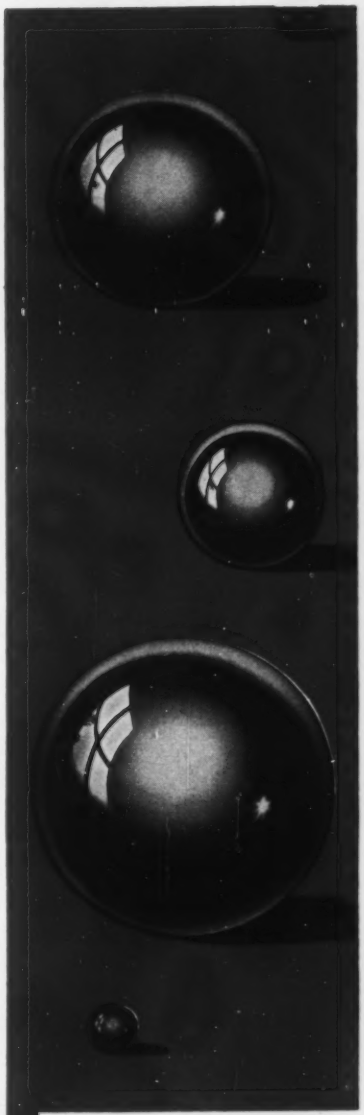
The Federal Power Commission says that by 1980 electric power loads of utility systems in the U.S. will reach 335 million kw, up 103 million from the 1955 level. This means an output of 1821 billion kw-hr of electric energy, compared with 553 billion two years ago. In 1955, the commission made a similar study and predicted 1980 loads of only 312 billion kw. For metalworking, this will mean a constantly expanding market for generating and related equipment.

Construction Starts Slowly

Construction is getting off to a slow start in 1957, according to figures from *Engineering News-Record*. Heavy construction awards for the week ended Jan. 24 fell to $221.1 million, the lowest level since the first week in January, 1956. The cumulative value for the first four weeks of 1957 ($1,256,906,000) is 21 per cent below last year's figure.

Living Costs Move Up

The cost of living continues to rise, reaching 118 per cent of the 1947-1949 average during December. Despite government actions to halt inflation, there is no end in sight for the trend. Ewan Clague, commissioner of the Bureau of Labor Statistics, indicates the index for January and February will go even higher. Wholesale prices also continue to climb. The all commodities index hit 117 (1947-1949 = 100) during the week ended Jan. 22. The rate of increase is becoming more rapid. It took this index 13 weeks to go from 115 to 116. It went from 116 to 117 in just seven weeks.



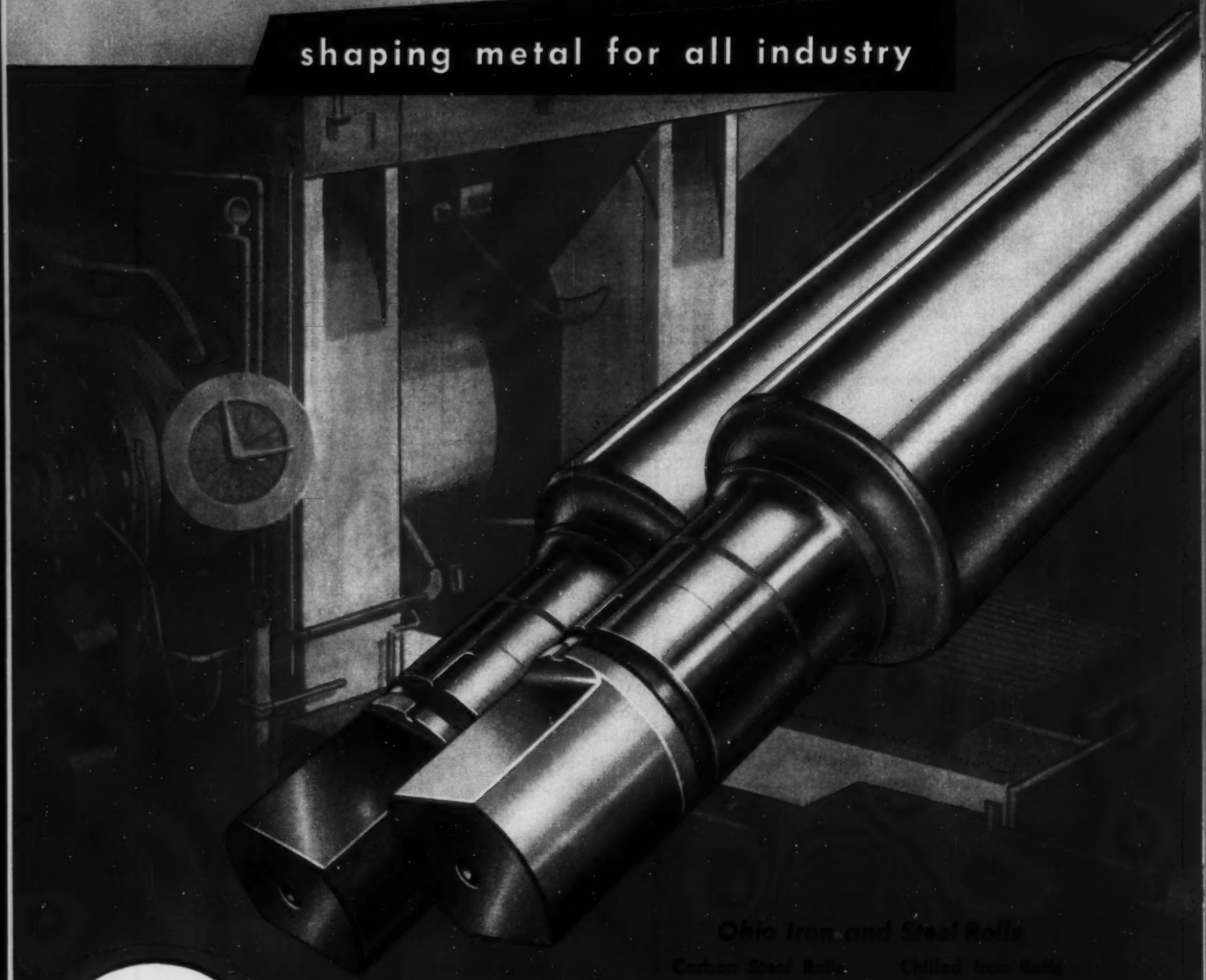
COOLIDGE
Balls

CHROME ALLOY AND STAINLESS

COOLIDGE CORPORATION
MIDDLETOWN, OHIO

Ohio Rolls

shaping metal for all industry



Ohio Iron and Steel Rolls

Carbon Steel Rolls — Chilled Iron Rolls
Ohloloy Rolls — Dense Iron Rolls
Ohloloy "K" Rolls — Nickel Grain Rolls
Flintuff Rolls — Special Iron Rolls
Double-Four Rolls — Nicloy Rolls
Forged Steel Rolls

OUR 50th YEAR
1907
1957

THE OHIO STEEL FOUNDRY CO.
LIMA, OHIO

Plants at Lima and Springfield, Ohio

JAMES H. SUTHERLAND
SKF sales director

MANUEL F. DIAZ
Wesson Tool president

FRED O. KOCH
Nooter Corp. v. p.

GEORGE W. STAMM
Crucible gen. sales mgr.

James H. Sutherland was made director of sales, **SKF Industries Inc.**, Philadelphia. **Edward H. Wagner** was made midwestern regional sales manager, Chicago, succeeding Mr. Sutherland.

J. D. McCall was appointed vice president - operations, **Columbia-Geneva Steel Division**, U.S. Steel Corp., at San Francisco. He was general manager-operations.

J. L. McBride, Los Angeles district purchasing agent for **Bethlehem Pacific Coast Steel Corp.**, transferred to general offices in San Francisco as assistant purchasing agent in charge of iron and steel scrap purchase.

Howard S. Thrasher was promoted to general sales manager, **Seymour Mfg. Co.**, Seymour, Conn. **Adolph W. Grele** was named assistant sales manager. Mr. Thrasher continues to head sales activities of Phosphor Bronze Corp., subsidiary. **Philip L. Thomson** was made purchasing agent to replace **W. O. Bennett**, resigned.

Andrew J. Snow was promoted to sales manager, furnace and oven division, **W. S. Rockwell Co.**, Fairfield, Conn. He was sales engineer.

J. R. Hursh was promoted to chief products engineer in the engineering department of **Armco Drainage & Metal Products Inc.**, Middletown, O., subsidiary of Armco Steel Corp. He was division sales engineer, eastern division, at Baltimore.

Manuel F. Diaz was elected president of **Wesson Tool Co.**, Ferndale, Mich., succeeding **Ernest Mortensen**, retired. **Nicholas Jacoby** was made general superintendent.

Fred O. Koch, general superintendent, **Nooter Corp.**, St. Louis, was elected a vice president.

J. D. Kennedy, manager of component sales for **General Electric Co.'s** metallurgical products department, Detroit, was made manager, industrial diamond section, to succeed **J. S. Gillespie**, recently named manager of engineering.

Joseph A. Linesch was made purchasing agent, **Consolidated American Industries Inc.**, Culver City, Calif.

L. E. Dalton was elected vice president-manufacturing for all divisions of **Kelsey-Hayes Co.**, Detroit.

Alfred C. Laessig was elected president of **Unit Rail Anchor Co. Inc.**, subsidiary of Hubbard & Co., Pittsburgh. He was a vice president of the parent company in charge of its tool division.

Raymond R. Dirksen was made assistant sales manager, Dynamatic Division, **Eaton Mfg. Co.**, at Kenosha, Wis.

David G. Osterer was elected chairman, **New Rochelle Tool Corp.**, New Rochelle, N. Y. He is president and chairman of New Rochelle Precision Grinding Corp.

Crucible Steel Co. of America, Pittsburgh, appointed **George W. Stamm** general manager of sales; **C. S. Mushinski** and **James E. Nordheim** to new posts at its Park Works. Mr. Mushinski was named superintendent-bar products; Mr. Nordheim, superintendent - flat rolled products.

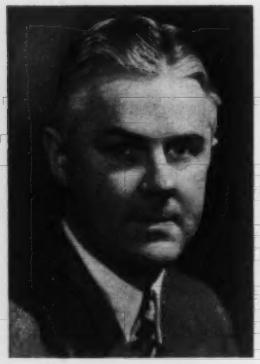
Oscar E. Sundstedt was elected president and general manager, **General Foundry & Mfg. Co.**, Flint, Mich. He succeeds **Carl W. Bonbright**, retired. Mr. Sundstedt was vice president-general manager. **Samuel M. Bickley** was made vice president-assistant general manager.

Superior Steel & Malleable Castings Co., Benton Harbor, Mich., promoted **Clinton Westin** to assistant general manager. He is succeeded as chief metallurgist by **Jay Rakstis**, former chief chemist.

Corbie L. Wilson was made general manager of the newly formed metal building division of **Parkersburg Rig & Reel Co.**, division of Parkersburg-Aetna Corp., Parkersburg, W. Va. He was with Reynolds Metals Co. as national sales manager of its building products division.

Oswald Tower Jr. was made assistant to the president of **Michigan Seamless Tube Co.**, South Lyon, Mich. Former plant superintendent, he was appointed last November to the president's office to do special assignments.

Quaker State Metals Co., Lan-



ANDREW L. ROWE

THOMAS J. MOORE JR.

positions at La Salle Steel Co.

A. O. MALONEY

F. S. MITCHELL

Chrysler plant managers

caster, Pa., appointed **Hilliard Y. Smuck** general manager-sales.

Andrew L. Rowe, formerly a vice president of Elgin National Watch Co., joined **La Salle Steel Co.,** Chicago, as assistant to the president. **Phillip H. Smith** was made director of purchases to succeed **Thomas J. Moore Jr.,** who was made director of product planning and diversification.

Joseph J. Storch was elected executive vice president, **Schacht Steel Construction Inc.,** New York. He was vice president-general manager. **Samuel Lipton** was made vice president, continuing as production manager.

David S. Leavitt, former vice president - general manager, Nikoh Tube Co., was elected president of **Leavitt Tube & Metal Co. Inc.,** Chicago. **Myro R. Leavitt** was elected chairman. **Albert H. Pelino** was named vice president-operations; **Ronald N. Leavitt** and **Kenneth M. Leavitt,** vice presidents.

Bohn Aluminum & Brass Corp.'s **Betz Division,** Danville, Ill., appointed new sales managers: **Robert L. Hodapp,** heat transfer products; **Russell E. Keller,** industrial air conditioning; **Robert W. Carvell,** commercial sales.

Delco Products Division, General Motors Corp., Dayton, O., appointed **Robert W. Leland** engineering manager of electrical products; **George W. Jackson,** engineering manager, automotive and mechanical products.

Chain Belt Co., Milwaukee, named **J. B. Roberts** eastern regional sales manager; **William Sivyer,** midwest and southern regional sales manager; **H. F. Bergis,** northwestern regional sales manager.

C. E. Russell was promoted from works manager to vice president-manufacturing at **J. B. Beaird Co. Inc.,** Shreveport, La.

Emmett H. Mann was named vice president-general manager, **Leschen Wire Rope Division,** H. K. Porter Company Inc., St. Louis.

Federal - Mogul - Bower Bearings Inc., Detroit, appointed **Robert E. Klare** general manager of its Federal-Mogul Division. **Robert W. Muzzy** was named executive assistant to Mr. Klare in addition to his duties as manager, central order department.

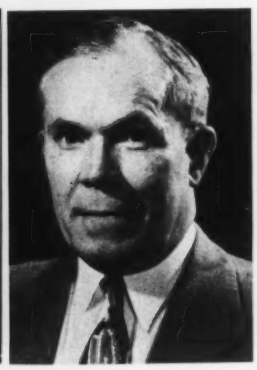
Chrysler Corp., Detroit, named **A. O. Maloney** manager of its Lynch road plant replacing **R. A. Thomson,** retired. **R. K. Kraebber** fills the new post of manufacturing manager there, reporting to Mr. Maloney. **F. S. Mitchell,** former staff executive in the stamping and general manufacturing group, was made manager of the Eight Mile road plant. **C. J. Firth** was named manager at Los Angeles.

H. A. Lockhart succeeds **H. P. McQuilkin,** retired, as general purchasing agent of **Baltimore & Ohio Railroad,** Baltimore.

Andrew T. Fischer was named marketing director of **Logistics Research Inc.,** Redondo Beach, Calif.

W. Houston Blount was elected

IRVING A. DUFFY



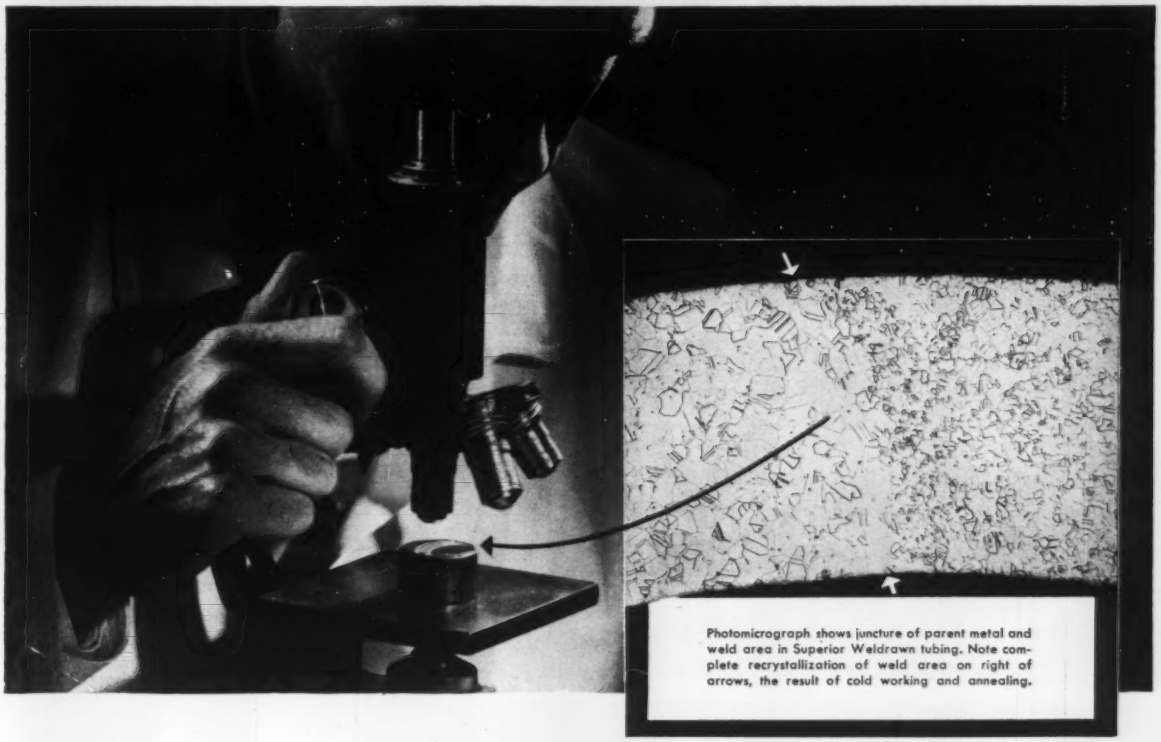
RAY H. SULLIVAN

JOHN DYKSTRA

group vice presidents at Ford Motor Co.

Ford Motor Co., Dearborn, Mich., appointed three group vice presidents who will report to D. S. Harder, executive vice president-basic manufacturing divisions. They are **Irving A. Duffy,** vice president-general manager, tractor and implement division; **Ray H. Sullivan** and **John Dykstra,** vice presidents and group executives.

Weldrawn® Tubing *by* Superior



Photomicrograph shows juncture of parent metal and weld area in Superior Weldrawn tubing. Note complete recrystallization of weld area on right of arrows, the result of cold working and annealing.

So perfect the bead actually vanishes!

Here's how to cut tubing costs up to 50%

Specify Superior Weldrawn. You get quality approaching that of seamless, at savings as high as 50%! Unlike other welded tubing, Weldrawn is offered in *any* of the intermediate sizes—made possible because of the redrawing after welding.

"Weldrawn" Means—

This is a tubing far superior to ordinary welded tubing for many applications requiring forming, machining and corrosion resistance. After welding, it undergoes alternate cold drawing and annealing.

The weld area recrystallizes (see photo above), acquiring mechanical properties equivalent to those of the parent metal. The bead actually vanishes!

Costs Are Low

Weldrawn tubing is produced in 18 different analyses, in a wide variety of sizes. Cost savings are 10 to 20%. In certain materials you save up to 50%!

Quality Is High

In Weldrawn you get tubing with highly uniform mechanical properties throughout, and clean, smooth, bright ID and OD surfaces. Because no filler or flux is used during welding, the corrosion resistance of the weld area is equal to that of the parent metal. And by repeated redrawing and annealing after welding, any possible faults or defects in the weld are eliminated.

Specify Superior

In addition to Weldrawn tubing, we also offer a wide variety of analyses and sizes in Seamless grade. So for the finest in small tubing, always specify Superior.

Whatever your problems in small tubing, Superior can help you. For additional information on Weldrawn, write for Data Memorandum No. 2. Superior Tube Company, 2005 Germantown Ave., Norristown, Pa.

Superior Tube

The big name in small tubing

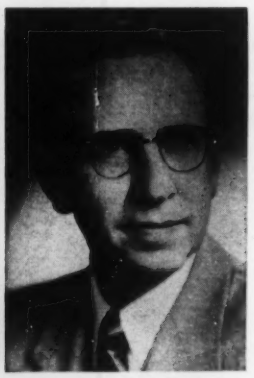
NORRISTOWN, PA.

All analyses available in .010 in. to ⅝ in. OD—certain analyses in light walls up to 2½ in. OD

West Coast: Pacific Tube Company, 5710 Smithway St., Los Angeles 22, Calif. • RAymond 3-1331

MAURICE R. EASTIN
joins Brush Electronics

ERVIN J. BAUMRUCKER
Clearing Machine post



EARL R. FREDERIKSEN
Jacobsen purchasing v. p.

ADOLPHE J. DE MATTEO
Watson-Stillman gen. mgr.

RAYMOND C. FIRESTONE
Firestone president

ROBERT W. WOLFE
New Process Gear sales post

president, **Southern Ven-Vi-Ro Pipe Corp.**, Birmingham.

Farrel - Birmingham Co. Inc. appointed **Adolphe J. De Matteo** general manager of its **Watson-Stillman Press Division**, Roselle, N. J. He was chief engineer. He now directs engineering and sales.

Raymond C. Firestone was named president, **Firestone Tire & Rubber Co.**, Akron. He succeeds **Lee R. Jackson**, now vice chairman. **James E. Trainer** was elected executive vice president; **Harvey H. Hollinger** and **John L. Cohill**, vice presidents.

Edward M. Grady was made assistant to vice president-sales, **Western Brass Mills Division**, Olin Mathieson Chemical Corp.

James E. Bates was made purchasing agent for **United States Chemical Milling Corp.**, Manhattan Beach, Calif.

Joseph R. Connors was made Philadelphia district sales manager, **Brunner Mfg. Co.**, succeeding **Frank Wilson**, retired.

Robert W. Wolfe was made general sales manager, **New Process Gear Corp.**, Syracuse, N. Y. He succeeds **Harry S. Thurner** who remains as sales consultant. **Thurman O. Ruettinger** was made chief engineer.

Jensen Specialties Inc., Detroit, named **Ben Milt** sales manager; **John J. Casey**, chief engineer; **Bruce S. Stewart**, factory sales engineer.

Edward W. Forth, vice president-manufacturing, **DeWalt Inc.**, subsidiary of **American Machine & Foundry Co.**, was named vice president-general manager of **AMF Cycle Co.**, Little Rock, Ark. **Albert C. Wedge**, production superintendent for DeWalt, was named director of manufacturing. **John C. Dabney** was made AMF director of marketing.

John E. Meyers was made Pittsburgh district sales manager, metal products division, **Koppers Co. Inc.** He is succeeded as Philadelphia district manager by **E. Ralph Gibbs.**

Maurice R. Eastin was appointed general sales manager, **Brush Electronics Co.**, Cleveland, a division of Clevite Corp. He was sales manager and assistant general manager, Perfex Division, General Controls Co.

Ervin J. Baumrucker was made general sales manager, **Clearing Machine Corp.**, Chicago, division of U.S. Industries Inc. He was Detroit district sales manager. **F. W. Dorenbos** was made assistant chief engineer. He was in charge of the hydraulic press division.

Earl R. Frederiksen was made vice president - purchasing, **Jacobsen Mfg. Co.**, Racine, Wis. He was purchasing agent.

James E. Pierce was named Pittsburgh district sales manager. **Jones & Laughlin Steel Corp.** Formerly manager of the hot-rolled bar and shape product division, he is succeeded by **Ray G. Scoggins**, former assistant manager, tin mill products division. Mr. Pierce succeeds **William Miller**, retired.

Donald L. Mosher was named plant superintendent, **Vitro Rare Metals Co.**, Canonsburg, Pa.

James L. Sheehy was made western district manager at San Francisco for **Tube Turns Plastics Inc.**

John M. Rachal was elected a vice president of **Carrier Corp.**, Syracuse, N. Y. He continues as general manager, international division.

Duff-Norton Co., Pittsburgh, promoted **T. W. Krueger** to sales manager of its Jack Division, in charge of railroad, industrial and export jack sales.

James H. Brockway was elected vice president-sales, **Reif-Rexoil Inc.**, Buffalo. He was general sales manager.

Consolidated Diesel Electric Corp., Stamford, Conn., named **John F. Campbell** to the new post of director of operations, responsible for manufacturing, quality control and purchasing.

John H. Locke Jr. was made eastern district manager at Philadelphia for **John Bath & Co. Inc.**

Donald R. McCleary was made

NEW RELIANCE V★S Jr.

Get fast speed changes over a 30 to 1 range with this all-electric variable speed drive.

The new V★S Jr. gives you instantaneous speed changes, even under load, without belts, pulleys, or gears. This Reliance Drive puts the complete machine operation at the operator's fingertips. All functions, jog, start, stop, reverse and speed changes, are placed in a compact, remote control station.

There's a big power cushion in the motor, too . . . power for smooth speed pick up, even under heavy shock loads, and dynamic braking for fast controlled stops without shuddering or jerking.

The Reliance V★S Jr. is your answer to machinery drive problems in the ¾ to 4 horsepower range. Package construction makes installation easy; just plug it in to a single phase 220 or 440 volt a-c. line.

Write for complete details and prices. (D-1539)

RELIANCE ELECTRIC
AND ENGINEERING COMPANY

DEPT. 42A, CLEVELAND 17, OHIO • CANADIAN DIVISION: WELLAND, ONTARIO
Sales Offices and Distributors in Principal Cities

FRANK RAY JR.
Morgan Construction post

T. J. NOLAN
Atlas Steels chief eng.

CHARLES S. ROCKWELL
Ford Instrument v. p.

manager of **Fruehauf Trailer Co.'s** branch factory in Ft. Wayne, Ind.

Frank Ray Jr. fills the new post of director of purchases at **Morgan Construction Co.**, Worcester, Mass. He was purchasing agent at Wico Electric Co.

Verson Allsteel Press Co., Chicago, appointed **Rear Adm. William O. Gallery,** USN, ret., as vice president-administration. **Melvin D. Verson** was made vice president-marketing.

William H. Uren was appointed operations manager of **Sahlin Engineering Co. Inc.**, Birmingham, Mich. He was purchasing agent.

Dewey H. Nelson was promoted to sales manager, **Becco Chemical Division,** Food Machinery & Chemical Corp., Buffalo. He succeeds the late **John F. Shea,** vice president-sales.

Dr. Kenneth W. Newman was made chief process engineer, **Turco Products Inc.**, Los Angeles.

R. W. Hopewell was named manager of field engineering for the industrial division of **Gould-National Batteries,** Trenton, N. J.

Treadwell Engineering Co., Easton, Pa., appointed **H. J. Leaver** vice president-production; **L. C. Milheim,** vice president-treasurer and secretary.

Walter G. Edwards was made manager - engineering department, electronics division, **National Cash Register Co.**, Hawthorne, Calif.

Charles H. Zweifel was made chief engineer, **Pacific Coast Engineering Co.**, Alameda, Calif.

T. J. Nolan, assistant chief engineer, **Atlas Steels Ltd.**, Welland, Ont., was promoted to chief engineer.

Charles S. Rockwell was named vice president and general manager, **Ford Instrument Co.**, division of Sperry Rand Corp., Long Island City, N. Y. He was vice president and works manager of the Sperry Farragut Division.

James M. Arnold was elected vice president and assistant general manager of **Recordak Corp.**, subsidiary of Eastman Kodak Co. at New York.

Frank H. Rundle was made manager of operations, Chicago district, **U.S. Steel Supply Division,** U.S. Steel Corp.

Anthony J. Gizzi was made manager, specialty resistor project, at **General Electric Co.'s** metallurgical products department, Edmore, Mich., plant.

Thomas E. Darnton was made director of purchases, **Oldsmobile Division,** General Motors Corp., Lansing, Mich. He succeeds **A. E. Goossen,** retired.

James O. Dague was made superintendent of the big mechanical department at **Bethlehem Steel Co.'s** Lackawanna, N. Y., plant. He succeeds the late **W. C. Daniels.**

Warren J. Haeger was made project manager, construction division, **Abell-Howe Co.**, Chicago.

Andrew Shirmer was appointed head of **S & S Machinery Co.'s** rebuilding division, Brooklyn, N. Y.

Adolph Q. Lundquist was made a vice president of **Union Carbide Nuclear Co.**, New York.

Harry Schoenfeld was made manager of the Philadelphia plant of **Cometals Inc.**, subsidiary of Commercial Metals Co. He succeeds **William A. Bushman,** who was transferred to a new plant in Texas.

Frank W. Dowdican was named manager of metal building production for **Inland Steel Products Co.**, Milwaukee.

Philip I. Wolf was made field sales manager for Norelco instruments, **North American Philips Co. Inc.**, Mt. Vernon, N. Y.

A. L. Carroll and **H. S. Newhall** fill new posts in the engineering and construction department (Niagara Falls, N. Y.) of **Electro Metallurgical Co.**, division of Union Carbide & Carbon Corp. Mr. Carroll was named project comptroller, responsible for cost estimating and cost control, engineering cost section. Mr. Newhall will supervise development and service engineering.

OBITUARIES...

Roderic A. MacDonald, 66, chief engineer and assistant to the president of **Russell, Burdsall & Ward Bolt & Nut Co.**, Port Chester, N. Y., died Jan. 26.

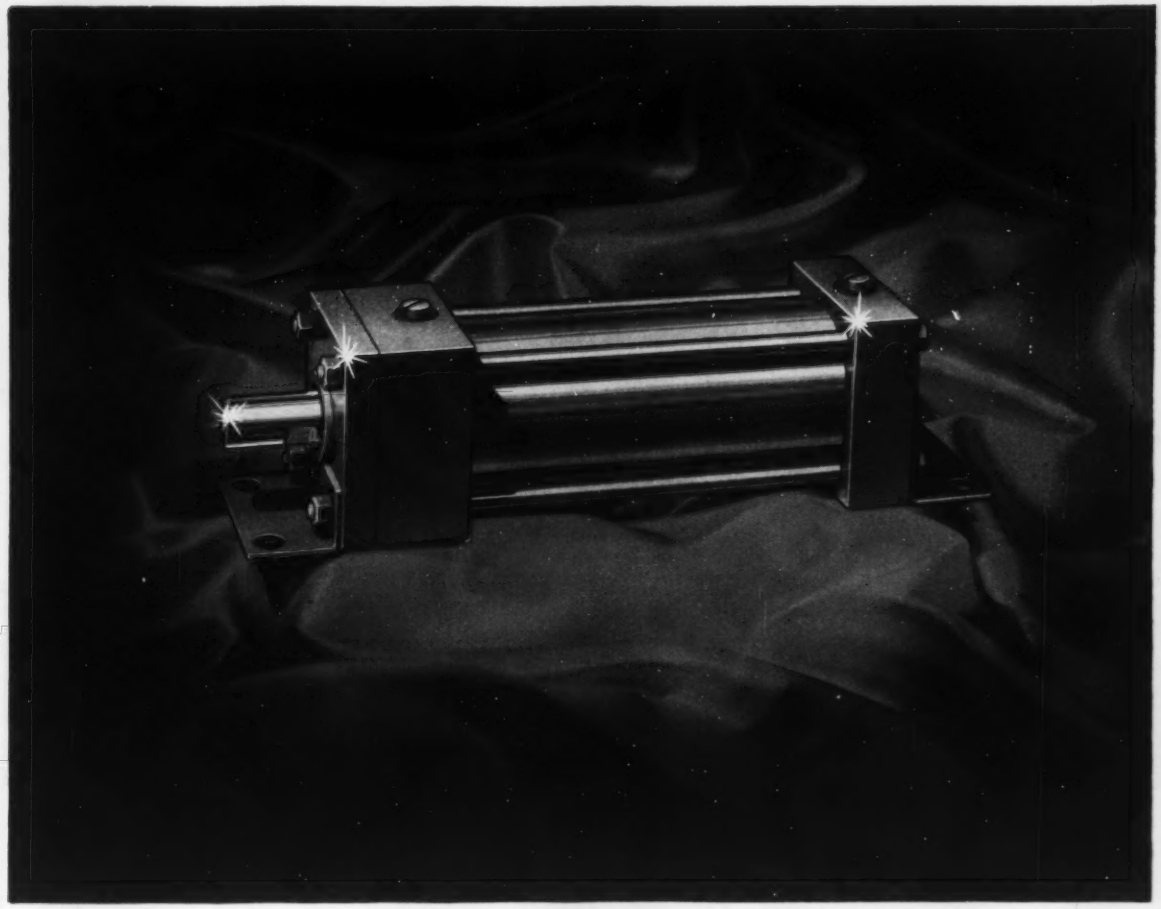
Harold Bonner, assistant sales manager, metal stamping division, **Transue & Williams Steel Forging Corp.**, Alliance, O., died Jan. 12.

George Long, 70, retired chairman and past president of **Koehring Co.**, Milwaukee, died Jan. 21.

J. H. Redhead, former president, **Lake City Malleable Co.**, Cleveland, died Jan. 22.

Iley P. Payne, 50, sales manager, construction equipment division, **International Harvester Co.**, Chicago, died Jan. 14.

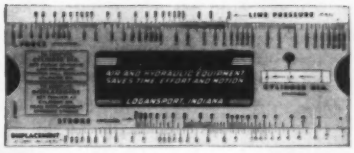
H. E. Ladwig, 61, retired works manager of **Allis-Chalmers Mfg. Co.'s** West Allis, Wis., foundry and pattern shops, died Jan. 21.



Illustrated—Logansquare Cylinder.

Look to Logan

the ultimate in air cylinder design



FREE SEND FOR THE "LOGAN CALCULATOR"
A gift to you from Logansport Machine Company upon request.

MEMBER: Natl. Mach. Tool Builders' Assn.; Natl. Fluid Power Assn.

LOGANSPORT MACHINE CO., INC.
851 CENTER AVENUE, LOGANSPORT, INDIANA

PLEASE SEND COPY OF CATALOG:

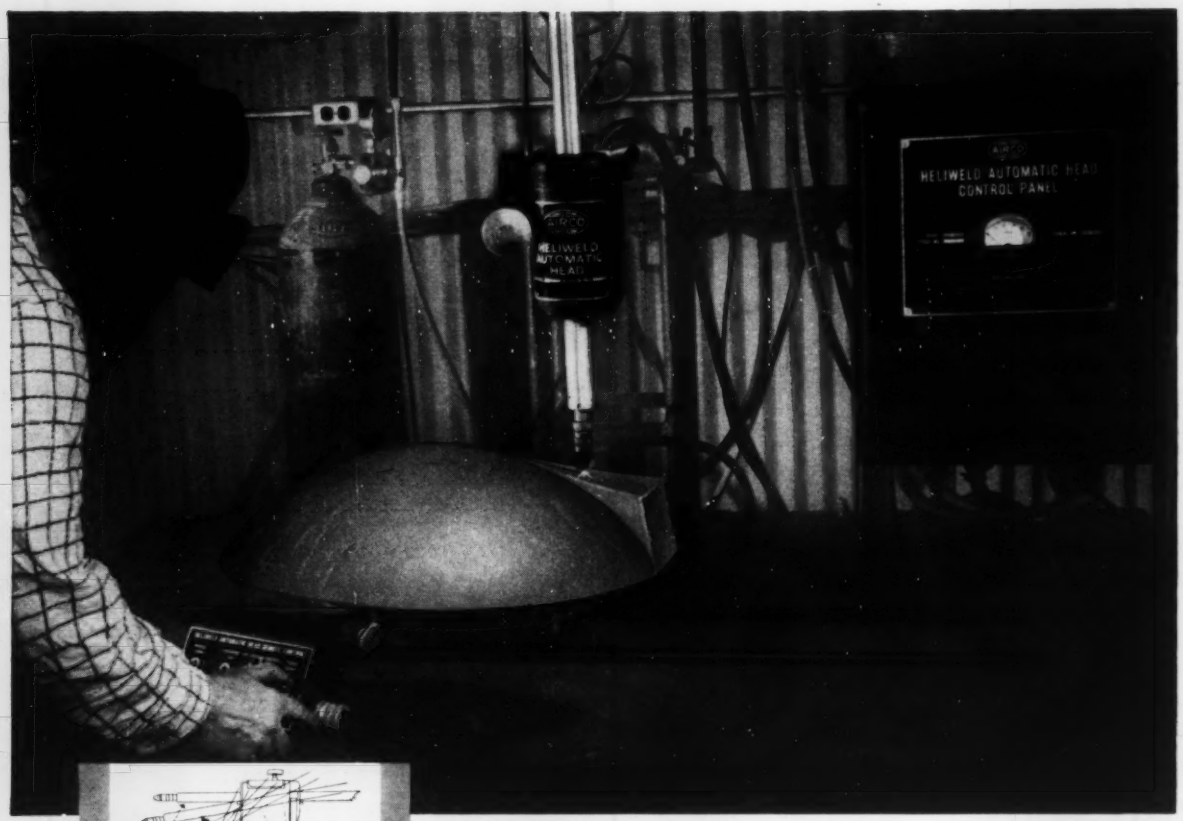
- ☐ 100-1 AIR CYLINDERS
- ☐ 100-2 MILL-TYPE AIR CYLS.
- ☐ 100-3 AIR-DRAULIC CYLS.
- ☐ 100-4 AIR VALVES
- ☐ 100-5 LOGANSQUARE CYLINDERS
- ☐ 100-5-1 ULTRAMATION CYLINDERS
- ☐ 51 PRESSES
- ☐ FACTS OF LIFE
- ☐ 62 SURE-FLOW PUMPS
- ☐ 200-1 HYD. POWER UNITS
- ☐ 200-2 ROTOCAST HYD. CYLINDERS
- ☐ 200-3 750 SERIES HYD. CYLINDERS
- ☐ 200-4 and 200-7 HYD. VALVES
- ☐ 200-6 SUPER-MATIC CYLS.
- ☐ 70-1 CHUCKS
- ☐ ABC BOOKLET
- ☐ CIRCUIT RIDER

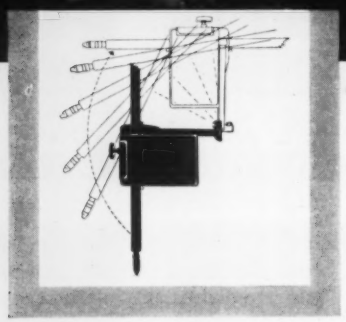
TO:

NAME_____ TITLE_____

COMPANY _____

ADDRESS _____





New Airco Model C Heliweld automatic head operates at all angles from horizontal to vertical.

Airco introduces New Automatic Heliweld Head for long-run production welding

The Model C Heliweld automatic head is specifically designed for long-run production on regular or irregular contours – aluminum tubing, motor stators, irregularly-shaped pressure vessels. Its prime advantage is that once the required arc length is set the head will automatically maintain this distance by moving the holder up or down to follow the contours of the work piece. Other benefits are:

- **Versatility** – unit provides good arc voltage control using either argon or helium shielding gases or mixture of both.
- **Adaptability** –the head can be operated at all angles from the horizontal to the vertical (normal) position. The maximum raise-lower distance of the electrode holder is a full 16".
- **Flexibility** – the assembly can be used for AC or DC welding, with or without filler wire. Electrode diameters range from .020 to $\frac{1}{8}$".

The use of the new automatic head will be required where welds of consistent dimensions and quality are important and where good weld appearance is necessary or where welding specifications are very high for the electrical, aircraft, and refrigeration industries. Complete information covering the wide range of applications and detailed specification data is available. Write Airco at the first opportunity.

AT THE FRONTIERS OF welding PROGRESS YOU'LL FIND . . .

AN AIR REDUCTION PRODUCT

AIRCO

Offices in most principal cities

AIR REDUCTION SALES COMPANY

A division of Air Reduction Company, Incorporated, New York 17, N. Y.

VISIT OUR BOOTH 334 WELDING SHOW

APRIL 9-11, 1957 • PHILADELPHIA, PA.

On the west coast –
Air Reduction Pacific Company

Internationally –
Airco Company International

In Cuba –
Cuban Air Products Corporation

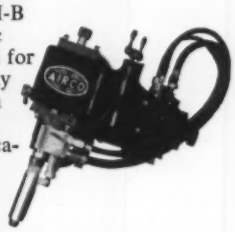
In Canada –
Air Reduction Canada Limited

Products of the divisions of Air Reduction Company, Incorporated, include: **AIRCO** — industrial gases, welding and cutting equipment, and acetylenic chemicals • **PURECO** — carbon dioxide, liquid-solid ("DRY-ICE") • **OHIO** — medical gases and hospital equipment • **NATIONAL CARBIDE** — pipeline acetylene and calcium carbide • **COLTON** — polyvinyl acetates, alcohols, and other synthetic resins.

Note these outstanding advantages of the new AMH-B

- Accommodates wide range of metal thicknesses — take fine wires (.030") for thin gauges, and up to 3/32" for normal gauges.
- Versatility — through availability of 3 machine barrels with duty ratings of 350, 500 and 600 amperes.
- Extreme compactness contributes to ease of installation, setting up, and servicing.
- Designed so that accessory equipment may be connected easily, quickly.
- Easy to mount: only standard 1½" steel pipe is required.
- Can be used with argon, helium, mixtures (AG 75) and CO_2 gases.
- Simplified design means easier maintenance and longer life.

You'll find the new AMH-B Aircomatic Head ideal for high quality welding on production type applications. For complete details



WRITE DIRECT TO AIRCO

Convair Retooling

Millions of dollars are going into the firm's program for its new jet airliner

CONVAIR, a division of General Dynamics Corp., San Diego, Calif., is spending millions for the machine tools and equipment it will need to build its 880, a four-engine, 80-passenger jet airliner.

Capital funds for heavy tools and other special equipment worth $2 million will be released early this year. This is in addition to orders worth more than $1,276,000 that have been placed since the new transport was announced in April.

Purchases—To date, orders for the program include:

A 105-ft Onsrud spar mill. Cost: About $521,000 installed.

A 75-ton Cyril Bath radial-draw stretch forming machine to shape extrusions and sheet metal parts. Cost: About $515,000.

A drying oven (to be built by Southern Engineering & Construction Co.) for the curing of adhesive-bonded wing panels. Cost: About $170,000.

Also a Boko universal pattern mill; a horizontal mill for boring and milling fixtures, tools and other equipment; heavy-duty welding equipment and other tools. Their total cost: More than $70,000.

An additional $172,000 has already gone into factory fixtures, jigs and other production tools.

Pending — Items that will be ordered early this year will include: A 14-ft vertical boring mill; paint spraying and drying facilities; a template camera; power substations to accommodate new machine facilities; additional adhesive bond curing facilities; automatic riveting equipment; engineering test facilities; a metal heat treating furnace; and specialized engineering and laboratory equipment.

Equipment orders placed and those contracted for in the next few months will amount to only a fraction of the development costs.

A 20,000 sq-ft building to house detailed full-scale mockups of the plane is completed, and a preliminary mockup has been moved into the $225,000 steel structure. The building will house one complete mockup and a fuselage mockup.

Norton Co. Makes New Product

Ceramic fuel elements (molded uranium oxide) for atomic reactors are being made by Norton Co., Worcester, Mass. Although this product is new, Norton is no newcomer to the field. It has been making boron carbide reactor control rods for about five years. For the last ten years, it has been making special high-purity refractory products used in the processing of atomic fuel. Further expansion into ceramic fields other than abrasives is part of the company's overall plans.

Gertsch Products Inc. Builds

Gertsch Products Inc. is building a 30,000 sq-ft plant in Los Angeles to manufacture precision electronic instruments. Completion is scheduled for May.

Adolph Plating Expands

Adolph Plating Inc. will start operations in its new $500,000 plant at 832 S. Central Ave., Chicago, in February. The firm specializes in cadmium, zinc and copper plating. The mechanical plating department will have the capacity to produce 200,000 lb of plated parts a day.

Youngstown Mfg. Opens Branch

Youngstown Mfg. Inc., Youngstown, opened a warehouse and branch sales office at 9 McCandless St., Linden, N. J. The facility will handle a complete stock of aluminum and stainless steel moldings and trim produced by the company.

Will Build Research Center

U.S. Industries Inc., New York, has established a new subsidiary, USI Technical Center Inc., to do research and development work for its 12 diversified divisions. The center will occupy temporary headquarters in Boca Raton, Fla., pending construction of facilities at Pompano Beach, Fla. President of the center is D. E. Gillum, formerly president of Western Design & Mfg. Corp., Santa Barbara, Calif. USI's

When you need 52100 steel bars and tubes go direct to Peterson....world's largest stocks. NOTE: For better machineability specify *leaded* bars.

52100

ONE WAY

PETERSON

STEELS, INC.

Union, New Jersey • Detroit, Michigan • Chicago, Illinois

divisions are chiefly active in heavy metal fabricating (machine tools), petroleum equipment, the water industry and electronic systems and components.

Ryan Aeronautical Builds

Ryan Aeronautical Co., San Diego, Calif., is constructing a $500,000 engineering and laboratory building in that city. It will contain laboratory equipment and instruments for use in chemical, metallurgical, instrumentation, environmental, physical, hydraulic and autopilot testing. An engineering machine shop will be included.

Standard Mfg. Opens Plant

Standard Mfg. Co. opened a plant in Vernon, Calif., to manufacture machine assemblies and stampings. The firm also does aircraft prototype machining.

Wehle Electric Buys Foundry

Wehle Electric Co., Buffalo, purchased the F. Dorries nonferrous metal foundry and machine shop in Buffalo. The foundry will continue under the management of W. E. Dorries. An addition to the foundry building will double productive capacity.

Essex Wire Builds Warehouse

Essex Wire Corp., Ft. Wayne, Ind., is constructing a $250,000 sales office and warehouse in South San Francisco, Calif.

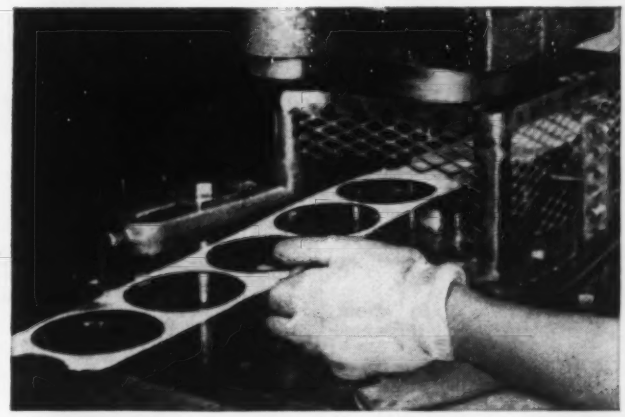
Gay-Lee Enlarges Facilities

Gay-Lee Co., Clawson, Mich., manufacturer of carbide tipped and solid carbide saws, has completed an addition to its plant. Manufacturing facilities have been increased 25 per cent.

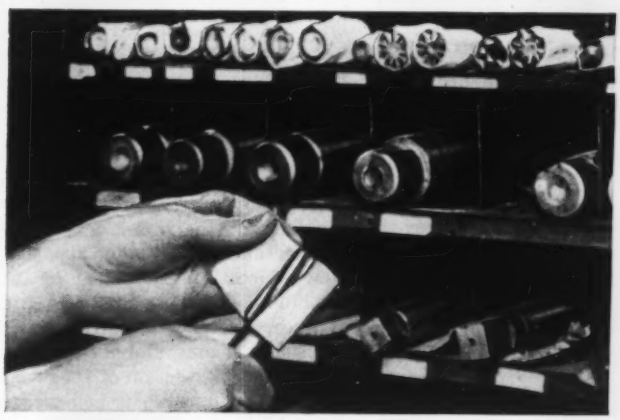
Coburn Engineering To Expand

Robert Pyle, president, and Richard Cunningham, vice president and secretary, Coburn Engineering Co. Inc., Chicago, have purchased controlling interest in that company. Coburn specializes in the engineering and fabrication of foundry, conveyor, coal process-

LOW-COST TAPE for that "EXTRA OUNCE OF PREVENTION"



Low-cost tape aids fabrication work. No rejections due to scratches or rough fragments left on stainless steel by this punch-press operation, thanks to the superior cushioning and abrasion-resistance of low-cost Polyken Tape No. 113. Speedy, clean removal.



Low-cost tape guards tools in storage. Polyken Tape No. 133 provides a durable cloth backing for sharp cutting edges . . . yet it pulls off clean and quick when the tools are ready for use.

See how the Polyken economy-utility line protects product quality during fabrication . . . in storage and shipment

Because you can select the right *Polyken* Tape for the right job, you get all the sticking power . . . all the tensile strength . . . all the tear resistance you need.

The important thing is, you don't pay for special qualities you don't need. That way—with low-cost *Polyken* Economy-Utility Tapes—you do the job right (whether it be sealing, holding, bundling or protection) for the *least* amount of money.

When you do need other special qualities there are other *Polyken* Tapes to fill the bill.

Polyken®
INDUSTRIAL TAPES
THE KENDALL COMPANY
Polyken Sales Division

MAIL THIS COUPON NOW!

Polyken, Dept. S-B
309 West Jackson Blvd., Chicago 6, Illinois

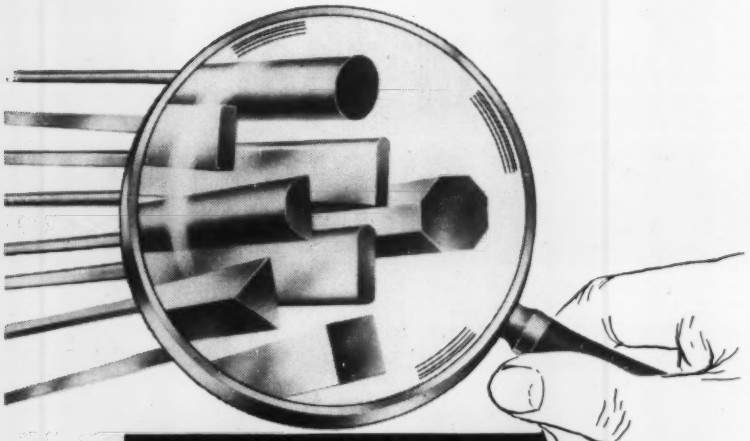
Please send me your latest sample and data file on the complete line of Polyken Economy-Utility Tapes.

Name_____ Title_____

Company_____

Street Address_____

City_____ Zone____ State_____



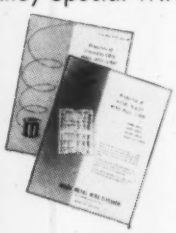
ALLOY
SPECIAL
WIRE SHAPES

Cut Costs . . .
Improve Product Performance

Alloy Special Wire Shapes reduce costly machining time and cut metal waste. No need to start with round wire and machine half of it away to get the shape you want. We can supply you with Stainless Steel and Nickel Alloy wire in just about any special shape you may require.

Drawn Alloy Wire Shapes provide other advantages in addition to reduced costs. Product quality and performance are also improved. The drawn wire insures uniformity of cross-section and a smooth, flaw-free surface.

Send today for information on Alloy Special Wire Shapes — and for our Nickel Alloy and Stainless Steel Properties Charts . . .



Write to Alloy Metal Wire Division, H. K. Porter Company, Inc., Prospect Park, Pa.

HKP ALLOY METAL WIRE DIVISION
H. K. PORTER COMPANY, INC.

ing and incinerator equipment. Expansion plans for this year include a move to a larger site.

Vulcan Tool Buys Brehm Die

Vulcan Tool Co., Dayton, O., purchased the Brehm Die Division of the Steel Products Engineering Division, Kelsey-Hayes Co., Detroit. Production will be moved from Springfield, O., to Dayton.

Republic Builds in Harrisburg

Republic Steel Corp., Cleveland, has completed construction of a drainage products plant at Harrisburg, Pa. The 20,000 sq-ft unit is operated by the Culvert Division and turns out corrugated metal pipe (6 in. to 7 ft in diameter) and metal pipe arches. Lewis D. Cisler is manager of sales for the division while L. W. Fletcher is branch manager in charge of sales at the Harrisburg office; C. L. Perrenoud is manager of operations.

Assembly Area Increased

Mattison Machine Works, Rockford, Ill., builder of surface grinders, is doubling its large machine assembly area by adding 16,800 sq ft of space.

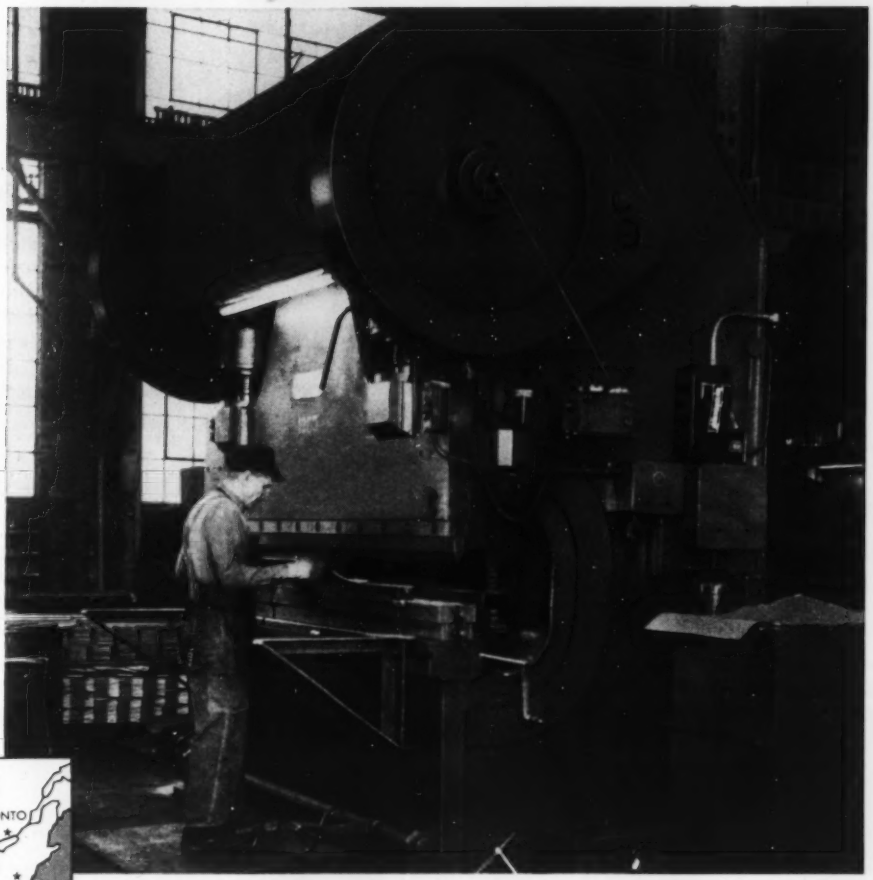
Adam Metal Supply Moves

Adam Metal Supply Co. has completed an expansion program which included moving to a 3-acre waterfront site in Long Island City, N. Y. New processing equipment of this aluminum distributor includes a 12-ft shear capable of cutting ½-in. stock and sawing and cut-to-length machinery. A section of the 53,000 sq-ft operating area is being readied for a second shear.

NEW ADDRESSES

Precision Steel Warehouse Inc. (strip steel specialists) moved to 3500 N. Wolf Road, Franklin Park, Ill.

Pic Design Corp. moved into its new plant at 477 Atlantic Ave., East Rockaway, N. Y. The firm recently became a division of Benrus Watch Co. Inc. It makes dif-



Installed in the Chicago plant in 1948, this 260 ton capacity machine, Model J4½-6, forms the smaller and lighter gauge conveyor panels. Illustrated is a curved section being formed of ⅜" plate to a radius of 8".

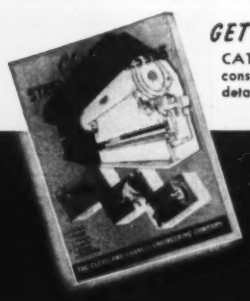
STEELWELDS Serve Link-Belt Plants *From Coast-To-Coast*

NINE LINK-BELT Company plants located from California to Pennsylvania, Texas to Ontario, Canada, and in Transvaal, South Africa, have one to six Steelweld Presses and Shears. Nearly every year since 1944 more Steelwelds have been purchased. Slightly over half of the machines are shears.

As a large manufacturer of a wide variety of conveying and processing equipment such as apron, screw, oscillating and overhead chain trolley conveyors, railroad car dumpers, bucket elevators and other handling equipment, Link-Belt plants must shear and form a great amount of steel plate. From experience, Link-Belt has learned that Steelwelds are outstanding for this work.

There are several reasons for this. For instance, the accessibility of controls and ease of making adjustments. The all-around solid construction that permits continuous operation with hairline accuracy. The heavy, well designed machinery which requires minimum maintenance.

Like Link-Belt, when you really get to know Steelweld Bending Presses, you, too, will be elated with their performance.



GET THIS BOOK!

CATALOG No. 2010 gives construction and engineering details. Profusely illustrated.

THE CLEVELAND CRANE & ENGINEERING CO.

7863 East 281st Street, Wickliffe, Ohio

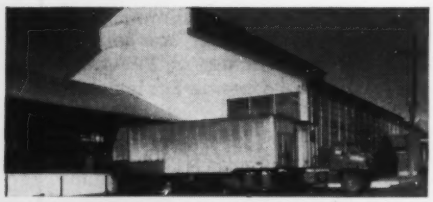
STEELWELD

BENDING PRESSES

BRAKING • FORMING • BLANKING • DRAWING • CORRUGATING • PUNCHING

LITHOFORM HELPS keep venetian blinds looking better longer. There's no chance that the enamel will peel off the metal—Lithoform anchors it firmly.

ACP Lithoform® KEEPS PAINT ON CADMIUM, GALVANIZED IRON, AND OTHER ZINC SURFACES



PAINT STAYS ON this galvanized building. The roofing and siding were treated with Lithoform before painting. No peeling of the finish has occurred and the paint finish lasts longer.

NO COSTLY MAINTENANCE is required to protect outdoor signs, rain gutters, spouting and eave troughs when the galvanized iron has been treated with Lithoform. The paint finish won't peel off.

Keeping paint on cadmium, galvanized iron, and other zinc surfaces has always been a problem. A good solution to it is use of Lithoform. This forms a nonmetallic coating which becomes an integral part of the surface treated, resulting in an excellent bond for the paint and preventing any undesirable chemical reaction between metal and the film. Lithoform anchors the finish firmly even when the metal is exposed to weather.

LEARN ALL ABOUT ACP LITHOFORM. Bulletin 1481 describes the various types of ACP Lithoform and gives information which will help you select the proper type for your particular application. Write for your copy today.

AMERICAN CHEMICAL PAINT COMPANY
Ambler 19, Pa.
Detroit, Mich. • St. Joseph, Mo. • Niles, Calif. • Windsor, Ont.

CHEMICALS ACP PROCESSES

New Chemical Horizons for Industry and Agriculture

ferentials, couplings and other items.

ASSOCIATIONS

Hardware Merchants' & Manufacturers' Association, Philadelphia, elected these officers: President, C. B. Leinbach, Suppiee-Biddle-Steltz Co.; vice president, D. Rumsey Plumb, Fayette R. Plumb Inc.; secretary-treasurer, T. A. Fernley Jr., all of Philadelphia.

Air Moving & Conditioning Association Inc., Detroit, elected these officers: President, W. H. Rietz, Ilg Electric Ventilating Co., Chicago; vice presidents, R. W. Nelson, American Air Filter Co., Louisville, and F. W. McKenna, Kennard Corp., St. Louis; secretary-treasurer, J. P. Johnson, Swartwout Co., Cleveland. Reappointed as executive vice president is L. O. Monroe.

American Institute of Electrical Engineers, New York, has announced its slate of officers for 1957-58: President, W. J. Barrett, New Jersey Bell Telephone Co., Glen Ridge, N. J.; treasurer, L. F. Hickernell, Anaconda Wire & Cable Co., Hastings-on-Hudson, N. Y.; vice presidents, B. R. Teare Jr., Carnegie Institute of Technology, Pittsburgh; R. W. Oetinger, Duke Power Co., Charlotte, N. C.; A. G. Johnson, Omaha Public Power District, Omaha, Nebr.; O. A. Gustafson, General Electric Co., San Francisco; and G. F. Tracy, University of Toronto, Toronto, Ont.

Steel Plate Fabricators Association, Chicago, elected these officers: President, E. E. Michaels, Chicago Bridge & Iron Co., Chicago; vice president, W. B. Van Wart, Wyatt Metal & Boiler Works, Houston; treasurer, O. H. Lange, Hibben & Co., Chicago; executive director and secretary, J. Dwight Evans. Regional vice presidents are: Western, J. C. McPherson, Consolidated Western Steel Division, U.S. Steel Corp., Los Angeles; eastern, J. E. Jackson, Pittsburgh-Des Moines Steel Co., Neville Island, Pittsburgh; south-

This is an actual photo of a surface prepared by polishing and etching a cross-section of a forging, to reveal the "grain flow." (x2)

A PICTURE OF ADVANTAGES YOU CAN GET ONLY FROM FORGINGS

In the picture above you see the grain flow in a forging.

This picture demonstrates two things. First, the metal is dense and free from porosity. The impact or pressure of forging helps make it so. Such density is important when parts must have machined surfaces, when they must provide reliable strength and safety, and when they must be tight against leakage of liquids or gases. This quality reduces rejects and saves money. It contributes to safety and saves lives.

Second, notice how grain flow lines follow the shape of the part. This improves impact resistance and fatigue strength of the part. In closed-die forging, these flow lines can be positioned, to give maximum properties where they are needed. As a result, forged parts can be lighter, safer, stronger, and frequently less costly.

Thus this picture shows you why forged metal is *metal you can trust.* You can trust forgings for performance, and to save money. Find out how forgings can improve your products, your costs. Consult a *Forging Engineer,* and send for the booklets offered below.

closed-die **forgings** for metal you can trust

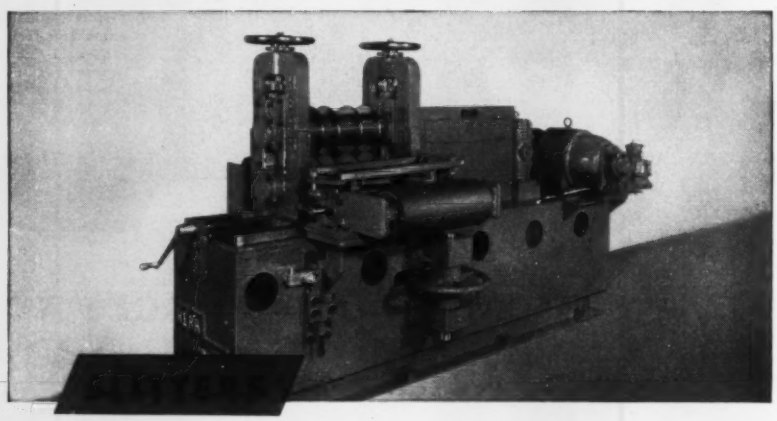
DROP FORGING ASSOCIATION
Dept. S, 419 S. Walnut St. • Lansing, Michigan

Symbolic emblem of the Drop Forging Association

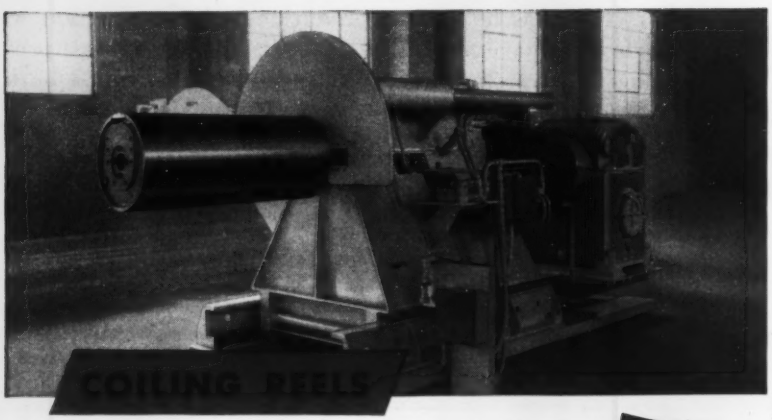
Attach this advertisement signature to your letterhead and mail to Drop Forging Association to receive booklet "What is a Forging?" ☐ or "Management Guide to Use of Forgings". ☐ Check title or titles desired.

HERR EQUIPMENT

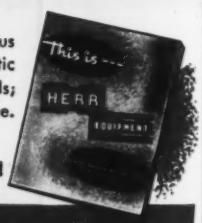
"Complete Processing and Handling Equipment . . . for any Ferrous or Non-Ferrous Material . . . That Starts — or Ends — as a Coil"



Built to insure dependable, high precision slitting. All thicknesses from .001 to ⅛", any commercial width. Quick, extremely accurate knife set-up. Also complete high precision slitting lines including pay-off reel, leveler, slitter, scrap winder, scrap chopper and coiling reel.



Wide variety of types and sizes for coiling ferrous and non-ferrous strip. Fixed, adjustable or automatically aligning bases. Automatic oscillating level winding drive if desired. Link type contracting mandrels; manually or hydraulically operated. Furnished complete ready for use.



Write for fully descriptive Bulletin No. 561 today!

THE HERR EQUIPMENT CORPORATION

1250 VINE STREET • WARREN, OHIO

CLEVELAND, INDIANAPOLIS AND BERKELEY, CALIFORNIA

east, J. T. Barriger, W. E. Caldwell Co., Louisville; southwest, B. B. Basom, Kansas City Structural Steel Co., Kansas City, Kans.

Jervis B. Webb, Jervis B. Webb Co., Detroit, was appointed chairman of the **Material Handling Division, American Society of Mechanical Engineers**, New York.

CONSOLIDATIONS

Leake Stamping Co., Monroe, Mich., has been merged into **Monarch Products Co.**, Hazel Park, Mich. It will be operated as a separate division of Monarch under the supervision of J. S. Leich, division manager. J. M. Leake is vice president in charge of engineering.

Purchase of **Prex Corp.**, by **Wyman-Gordon Co.**, Worcester, Mass., last fall has just been revealed. The Prex plant in Chicago has been sold, and a new plant is being built in the Franklin Park section of that city. Prex makes close tolerance, small aluminum forgings.

Chain Belt Co., Milwaukee, purchased **Chains Inc.**, Dolton, Ill., of which N. E. Pierson will be general manager.

American Gage & Machine Co., Chicago, acquired **Standard Transformer Co.**, Warren, O., maker of transformers. Chester F. Buckley has been named general manager and president of the Warren company which will be operated as an American Gage division.

Hubbard & Co., Pittsburgh, purchased **Illinois Gear & Machine Co.**, Chicago, whose expansion program is being stepped up. Another plant is being added to its South Works to accommodate new machinery estimated to cost $2 million.

American Machine & Foundry Co., New York, purchased **J. B. Beaird Co. Inc.**, Shreveport, La., maker of gas distribution systems, package compressors and pressure vessels. The firm also purchased **W. J. Voit Rubber Corp.**, Los Angeles, maker of tread and various other rubber products.

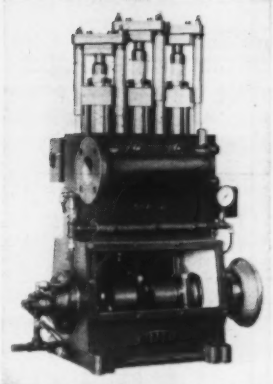
What you need here is an ALDRICH PUMP

The reliability of any central hydraulic system depends on the pump. If it's an Aldrich, you're sure of 100% availability of hydraulic power—with either oil or water.

Dependable service. Aldrich Pumps provide reliable, low-cost performance on such applications as die casting, hydraulic press operations, roll balancing, descaling and hydraulic testing. One reason is the simplicity of the Aldrich Direct Flow design, which permits horizontal straight-line flow from suction to discharge. Another is the reduced space between valves, which results in higher volumetric efficiency.

Easy maintenance. Fluid end sectionalization, changeable plunger sizes and interchangeability of parts provide fast, easy maintenance. Parts can be replaced easily and quickly, at low cost. Valves can be removed for inspection or replacement without special tools or equipment. Individual sections of the fluid end can be replaced at a fraction of the cost of conventional type fluid ends.

Get free details. Write today for a copy of Data Sheet 100, a condensed catalog and selection table covering our entire line. The Aldrich Pump Company, 18 Pine Street, Allentown, Pa.

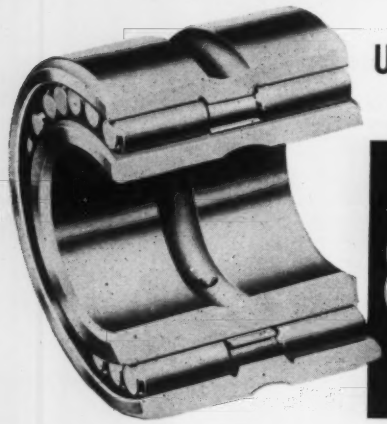


Aldrich "Power-Pac" Direct Flow Triplex Pump has no equal in a nominal 25 hp pump for descaling, die casting, roll balancing, press operation, hydraulic testing. Pressures from 390 psi to 20,700 psi.

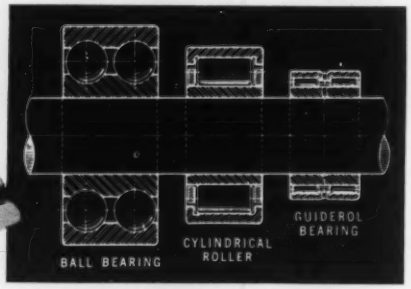
THE ALDRICH PUMP COMPANY

BEARING TIPS by McGill

To pack more performance in smaller space



Use space-saving McGILL GUIDEROL® needle bearings

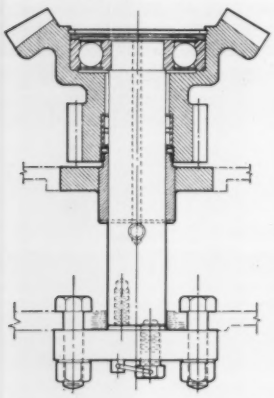


Showing graphically how a McGill GUIDEROL precision needle bearing permits more streamlined designing by supporting comparative loads in significantly smaller radial space than other types of bearings. Bulky and more costly housing space is easily avoided.

The McGill GUIDEROL Bearing combines the inherent high-load capacity of a full complement of full race width rollers with a center roller guiding principle that limits skewing and binding under misalignment. This qualifies the bearing for a whole range of applications that are too heavily loaded for a retainer-type bearing and are subject to the misalignment that precludes use of an ordinary needle bearing. For outstanding performance in small radial space, use GUIDEROL precision needle bearings. Specify the interchangeable sealed SGR series for added protection against contamination.

GUIDEROL® *bearing capacity, space economy proved in power shovel vertical reversing shaft assembly*

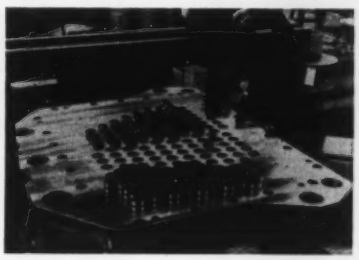
Baldwin - Lima - Hamilton Corp. uses a McGill GUIDEROL bearing, on ½ cubic yard power



shovels, to carry spur pinion loads in the vertical reversing shaft. The high capacity of the bearing in small radial space is an important factor in selection of this bearing. Only 3.75″ in diameter, it has a load capacity of 28,560 lbs. at 100 rpm. In the power shovel application, it supports 14,150 lbs. at 76.3 rpm, which gives a high margin of safety. The center guided rollers also are especially adaptable to a vertical application such as this.

Fact-packed Bearing Catalog

Write for your copy of Catalog #52-A, a 128 page Bearing Selection Guide. It contains vital product information and 30 pages of engineering data.



Multiple spindle drill heads require support of spindles on very close centers

Crowding a great number of drill spindles into a small area, Zagar, Inc., of Cleveland has found the McGill GUIDEROL bearing construction especially suited to the needs of multiple drill head units. The full bearing width rollers provide rigidity and more than adequate load capacity and in a bearing only 1.25″ in bore diameter.

Insure performance with McGILL®

MULTIROL® GUIDEROL® CAMROL
Precision Needle Bearings

McGILL MANUFACTURING COMPANY, INC., 301 N. LAFAYETTE ST., VALPARAISO, INDIANA

STEEL
February 4, 1957

Technical Outlook

ALUMINUM CASTING ALLOY—North American Aviation Inc., Los Angeles, is replacing high-strength forgings in its F-100 Super Sabre with cast parts made of a new aluminum alloy. Designated 42B, the alloy has a tensile strength of 42,000 psi when cast in a sand mold and 45,000 psi when cast in a permanent mold. It also has a good balance of yield and elongation. The company says that 42B is superior to other aluminum alloys in both strength and castability.

TRANSISTOR SWITCH—Power transistors capable of switching a load in excess of 1 kw are being produced. Advantages: It's possible to switch current from a distance using only thin wiring; arcing at the switch is eliminated, increasing switch life. Powerful motors can be directly controlled with an amplifier using the transistors, says the Delco Radio Division of General Motors Corp., Kokomo, Ind., the manufacturer.

PIPE SEAL—Plastic pipe fittings introduced by United States Rubber Co., New York, are lined with a thin layer of plastic. This makes the fitting's inside diameter slightly smaller than the outside diameter of the pipe, but a solvent softens the plastic layer enough to allow pipe and fitting to be pushed together. High contact pressure causes a strong weld.

OVERTIGHT BOLTS—If joint strength is your only concern in an assembly, it's almost impossible to get the nut too tight, say fastener specialists at Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y. If wrenching up doesn't break a bolt, it will never break or wear out in service—if it's the right bolt for the job. But if the fastener has to be removed and retightened in service, or if a soft-surfaced material is part of the joint, too much tightening is not desirable.

SELF SERVICE—The ultimate fastener that not only cuts its own threads, but also drills its own hole is on the way, say National Lock Co. (Rockford, Ill.) engineers. "Everybody's working on it." The question seems to be no longer "if" but "when" the first economical model will appear on the market.

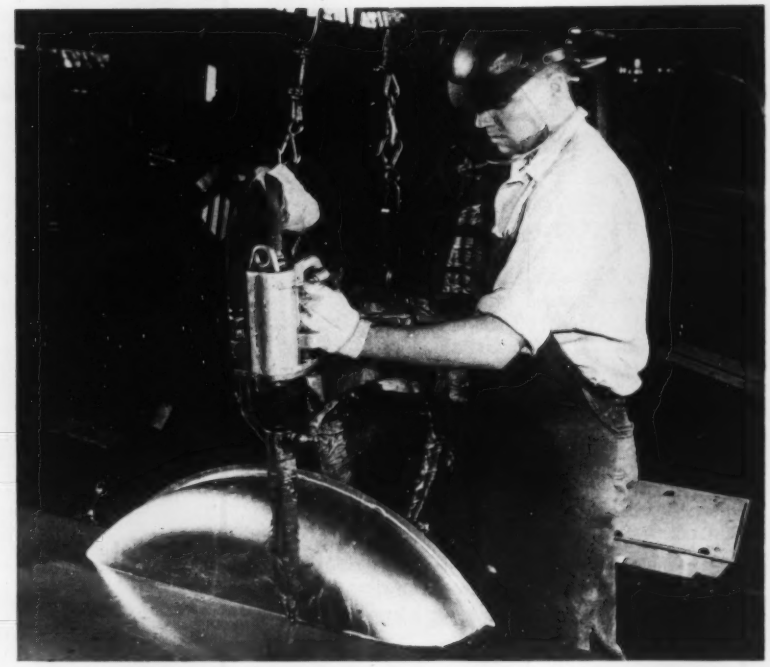
MULTIPLE TAPPER—A new machine taps multiple holes to different depths, reverses and backs out—all while the motor runs continuously in one direction. Fractional horsepower forward and reverse clutches, made by Warner Electric Brake & Clutch Co., Beloit, Wis., eliminate the need for a reversing motor and speed the operation. Ettco Tool Co., Brooklyn, N. Y., built the tapping unit.

FAST HOLE GAGE—A tapered, retractable needle, a precision clutch, and a magnified scale are the features of a direct reading gage which is claimed to be accurate to 0.0005 in. Called Kwik-Chek by the makers, Allied Products Division, Hamilton Watch Co., Lancaster, Pa., it measures holes between 0.025-in. and 0.380 in. in less than 5 seconds.

SPECIAL GRINDER—Ex-Cell-O Corp., Detroit, has a three slide grinder for finishing the curved roots (bases) of jet blades. It uses four wheels on three spindles. Two revolving trunnions carry the parts through the grinding cycle; one is loaded while the other cycles.

Metalworking Outlook—p. 53 Market Outlook—p. 147

Applied to parts before they're welded, the sealer forms a tight seam between spotwelds. It adheres to most metal surfaces—is resistant to water



Weld-through sealer goes on a fender well flange . . .

Sealer Closes Weld Seam

SEALERS put between sheet metal parts before they are welded are paying off for several automobile makers. The process saves time (it eliminates the need for post-weld sealing), simplifies handling and assures an effective seal.

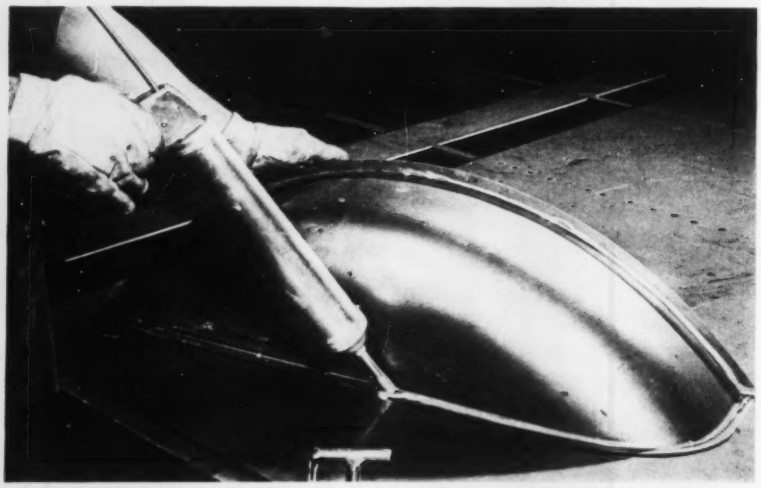
It's now used to seal the spotwelded joint between roof and side panels, to seal along drip moldings and to seal the joint between the rear quarter panel and wheel housing.

Drum Tight—As shown in the photographs, production men at Divco Mfg. Co., Detroit, also use the sealer between fender wells and sheet metal floor sections on custom-built trucks.

The sealer closes all potential voids between the two metal pieces. It doesn't burn or char, except at the immediate weld contact point. Users report welding procedures are not altered and weld quality is unaffected by the weld-through sealers.

Made by the Adhesives & Coatings Division, Minnesota Mining & Mfg. Co., Detroit, the sealer is said to withstand the effects of extreme heat without splattering, a must for spotwelding. The manufacturer also claims the product has excellent resistance to water and weathering. It adheres well to aluminum, steel and other metal surfaces.

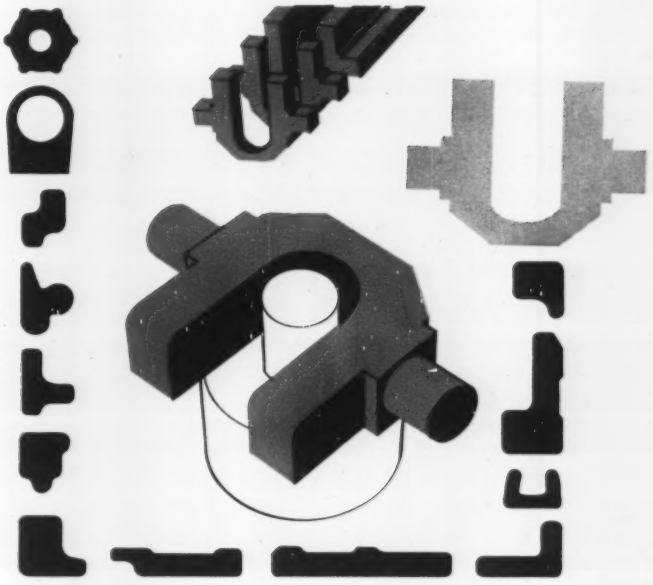
Technique—On the fender well job, the sealer is applied with a flow gun to the well flange and a portion of the truck body. Then the two parts are tacked together with a spotweld. The sealer is soft enough to squeeze away from the immediate weld area when electrode pressure is applied. Excess sealer is removed and the assembly is ready for further processing.



Spotweld completes assembly. Seam is watertight, weatherproof

production ideas

NO. 8 IN A SERIES



Winning points for hot extrusion are its savings in materials and machining time. Parts can be sliced from an extruded section

Pieces by the Slice

BUY YOUR PARTS — already shaped—by the bar. Slice them to the correct length and put them to work.

That's a sales pitch you'll be hearing more of this year. It belongs to a steel extrusion salesman. He won't have quite the variety of sizes and shapes aluminum extruders offer, but the potential savings in many carbon, alloy and stainless applications are worth investigating. For example:

Savings—A chain saw producer is buying a seven-toothed shape in 6-ft lengths. He cuts it to the correct width, drills it and has a 2-in. sprocket ready for use. No machining on the teeth is necessary. Savings: 35 per cent over former gear cutting methods.

A machine tool builder is saving over 50 per cent of his production costs on a tool steel pawl. The extruded shape costs him $2.17 a pound; savings come from the elimination of 11 milling operations. He slices the shape to width, drills it and it's ready for use.

An aircraft component maker switched from 410 stainless rectangular bars to an extruded shape with a small cross section. Material costs alone dropped from $22.50 to $14.80 per part. Although machining is still required to complete the part, the time required was cut in half.

Specifics — Hot extrusions are cost savers in these areas:

1. Materials—This is a big factor in stainless steel and high-cost alloys. Scrap loss reductions of 30 per cent are not unusual. You can buy many stainless extruded shapes at about the same basic price per pound as you can bar stock.

2. Machining time—Possibilities for savings run the gamut here. Steel extrusions can't approach the complexities available in aluminum, but, compared with hot rolling, the process does make more complex shapes possible. Most steel extrusions used today require some additional machining. But if you have been starting from conventional rounds, flats, hexes and squares, the reduction in machining time is substantial.

3. Roll costs for limited quantities—Mill roll costs of $3000, $5000 and higher are not unusual. Die costs for steel extrusions will run from $150 to $300 for most jobs.

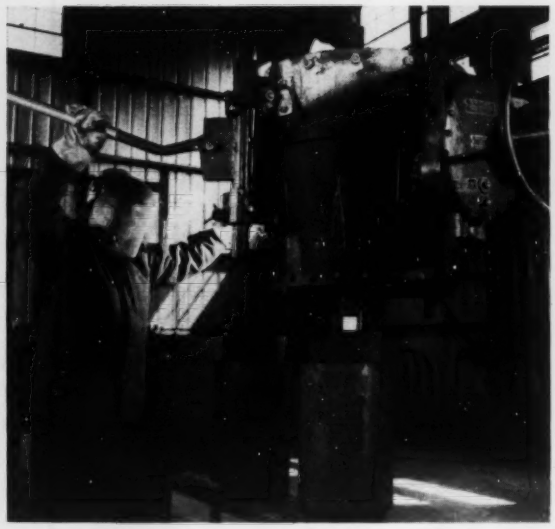
Properties Good—Tests by Allegheny Ludlum Steel Corp. show mechanical properties of steel extrusions compare favorably with those of other types of hot worked steels. Because extrusion is a severe hot working operation, the grain size tends to be fine and more uniform through the cross section than in material formed by hot rolling.

Tolerances that can be held are also comparable to those of hot rolled shapes. Here is Allegheny Ludlum's guide for the tolerance spread of different cross sections:

Under 1 in.	0.031 in.
1 to 3 in.	0.062 in.
3 to 4 in.	0.093 in.
Over 4 in.	0.125 in.

Lubricant—Most steel extrusions are being produced by the French Ugine-Sejournet process which uses molten glass as the die lubricant. Billets at 2100 to 2300°F are rolled over powdered or glass fiber sheets which form a glass film on the

INTEGRATION OF HOT EXTRUSION AT H. M. HARPER



H. M. HARPER's Metals Division extrusion operation in Morton Grove, Ill., is unique.

A specialty fastener maker, Harper formerly had to carry a tremendous inventory of wire and rods. The company's 1650-ton, Loewy-Hydropress extruder meant integration of operations and made it possible to reduce a normal inventory of wire and rod stocks from $1.5 million to about $400,000.

With four furnaces that have a melting capacity of 1¼-million lb a month, Harper does its own alloying and extrudes round and hex rods for its own use and shapes to sell in a variety of copper-base materials, stainless, carbon and alloy steels. With its own furnaces, Harper also re-uses its scrap.

billet. A glass fiber pad or powdered glass core is placed on the die face ahead of the billet.

This combination provides the best thermal protection for the die. Pressures developed in the container approach 150,000 psi at maximum force, and the speed of the extrusion through the die orifice is as high as 45 mph.

Needs Emphasized — Two basic obstacles face extruders: Better die composition and better lubricant are needed before the real potential of the process can be realized.

Much work is being done on both. Lubricants being experimented with include molten salt, organic greases, molybdenum disulphide, mica, graphite and combinations of them.

Dies have a life of 1 to 100 pushes; average is 40 or less. The cost saving feature is that tool steel dies can be cast.

Dies Shell Cast—H. M. Harper Co., Morton Grove, Ill., uses shell molded cast dies. The basic die pattern is made of highly polished aluminum. Shell molds can be made in the desired quantities, and dies can be cast from remelted broken or worn-out dies.

One of the key features of glass lubricant is its die coating characteristics. The die surface does not need to be highly polished; cast dies need a minimum of finishing. Rough grinding of the part-line and any irregularities is normally adequate. The glass also fills in minor surface defects.

The goal is to develop a die composition and lubricant combination which not only lengthens die life but permits more complex shapes to be formed.

Shape, Size Limits—Many cross sectional shapes are already being extruded; those illustrated on page 101 are representative. Most extruders will limit you to sizes which will fit in a circumscribed circle of 5¼-in. or less—that's the capacity of most presses. Minimum cross sectional area limitations (due to the flow characteristics of the metal) are 0.4 sq in. for carbon and alloy steels and somewhat higher for stainless.

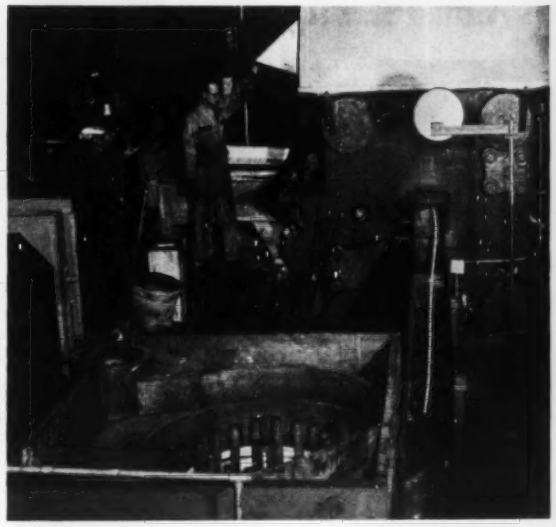
Sharp fillets and corners are difficult, often impossible, to extrude in steel. The normal range for corner radiuses, according to most extruders, is between 0.031 and 0.125 in. Fillets are normally held at 0.125 to 0.438 in.—the over-all geometry of the die orifice and metal being extruded are the governing factors.

Other rules-of-thumb: In shapes like the T and L, the usual cross section length to thickness ratio is about 10:1. In channels, the depth normally should be no greater than the width.

Stretch - Straightening — The glass from lubrication spalls from the shape on cooling. Stretch-straightening is used principally to maintain the longitudinal camber and twist tolerances. Studies by Allegheny Ludlum showed that stretch straightening, with a 1 to 2 per cent permanent set, increased ultimate and yield strength, with a slight reduction in elongation and area.

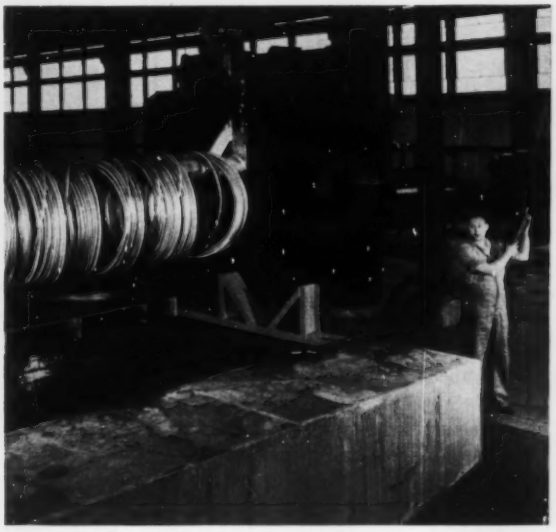
Surface finish of extrusions is affected by composition and extrusion variables. Allegheny Ludlum found these surface conditions to be representative:

Alloy and carbon steels
125-150 microinches



Round billets for extruding (photo 1) are cast in 5¼ and 6 in. diameters, in 16 to 22 in. lengths. The Ugine-Sejournet (glass) extrusion process requires a smooth bright surface on the billet. After casting, billets move to a peeling lathe (photo 2).

Billets are heated in a low-frequency induction furnace. Temperature between 2100 and 2300°F is attained in 4½ to 6 minutes.



Hot billets roll across powdered glass into the extrusion press billet container. An extruded rod (photo 3) goes from the press into an automatic coiler, is quenched and then put on a rack to cool.

Final operation is deglassing in hydrochloric-nitric acid at about 160°F (photo 4). After rinsing and spraying to remove the acid, the coil is ready to be pointed and cold drawn to final requirements.

Type 410 stainless
150-175 microinches
Type 304 stainless
200-250 microinches

Picking Up — Extruded hollow shapes are finding more uses, too. They're produced with a mandrel in front of the extrusion press ram. A glass fiber sleeve or sock on the mandrel provides lubrication. Drilled billets are used.

U.S. Steel's National Tube Division, Gary, Ind., extrudes stainless primarily. It reports increasing sales of hollow hexes to the dairy equipment industry. Hollow hexes 2 to 4 in. in diameter are supplied in lengths up to 15 ft. In making stainless nuts, they're cut to the proper width, threaded and faced. There is a substantial reduction in machining time. An east coast machine tool builder uses hollow hexes to make hydraulic actuating cylinders.

The Metals Processing Division of Curtiss-Wright Corp., Buffalo, extrudes its hollow steel propeller blades. Check the shape of your product. If it can be extruded, you will pare your costs. Here are some points to think about:

1. **Solid**—Consider this form for a part when a more efficient distribution of metal than is possible with rolled shapes or other forms is required. Through extrusion, the metal can be placed where it is needed to meet anticipated stresses.

2. **Semihollow** — Extrusions are ideal where undercuts are required, where thin sections must join thick sections or where compound curves are involved. Wall sections can vary from 0.125 in. up to several inches.

Hollow—Hollow sections of complex contour can be extruded. For flat sections, metal can be extruded as a hollow shape, then cut longitudinally and straightened. Example: Integrally stiffened skin for aircraft.

Stepped — Sections can be extruded which include unsymmetrical steps, since the shape of the part as well as its dimensions can be varied.

Tapered — By use of a tapered mandrel, it's possible to extrude a tube with a tapered wall. Wide changes in width, thickness and shape of a member can be extruded throughout its length. Preforming parts by step or taper extrusion before forging will reduce forging operations and may eliminate blocking operations entirely.

Tool Steel—Three years ago, Allegheny Ludlum came out with the first extruded tool steel. In addition to providing shapes too intricate to roll, extrusion offers two other advantages: 1. The tremendous degree of deformation in a short time insures a thorough working. 2. Decarburization or carburization is virtually eliminated because billets are heated in molten salt, and the extrusion is protected by a thin coating of glass during cooling. Allegheny Ludlum has extruded high speed, cold work, shock resisting, hot work, carbon and low alloy tool steels.

Jones & Laughlin Steel Corp. and others consider the cold drawing of extruded shapes as the logical extension of the hot extrusion process. This is particularly true in the carbon and low cost alloy steels where material expenses are low and the saving must come in the reduction of machining time.

Cold Drawn Part — J&L cold draws extrusions—mostly carbons

and alloys—it does not sell an extrusion as is.

One manufacturer formerly milled a pawl from a cold drawn flat at a cost of $2.41 per part. Using a J&L cold drawn extrusion which costs 34 cents a pound, the manufacturer has been able to reduce the cost of this part to 44 cents. His total effort: Slice the extrusion to size, drill a hole in the center.

Milling Eliminated — A Chicago printing equipment maker switched from milling to buying a hot extruded, cold drawn shape in making an adjusting screw bar. The bar is about 70 in. long and the shape is supplied in exact lengths at 36 cents a pound. Only drilling and tapping are required before the extrusion goes on the press. Saving: 50 per cent over former milling process.

Cold drawing not only improves the surface finish of the extruded shape, it makes possible closer tolerances and sharper corners and edges. The drawing speed for most shapes is considerably slower than that used in the conventional cold drawing of bars, and problems with dies are minor compared with those of the hot extrusion process itself.

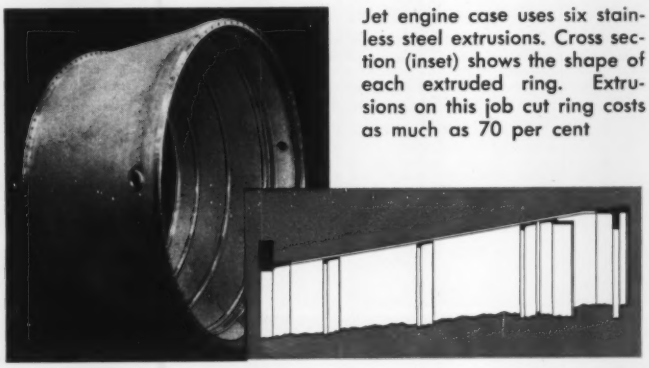
Developments—Another development to watch for is the use of clad metals. One company has already had promising results with assembled pierced billets. The clad bonding takes place during extrusion.

U.S. Steel extrusion experts are experimenting with several research grades of steel. In some of these, they point out, extrusion offers the only practical way of producing them because they're too costly to roll conventionally.

Nonferrous people are busy, too. Extrusions are getting bigger; brass sections with 7-in. cross sections have been extruded. Large magnesium extrusions are available in new, high-strength alloys. Titanium extrusion is growing (see STEEL, Dec. 10, 1956, p. 142 and Dec. 17, 1956, p. 100). Aluminum extruders are developing new alloys and new techniques for large, more complex shapes.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, O.*

Extrusions Cut Jet Engine Costs



Jet engine case uses six stainless steel extrusions. Cross section (inset) shows the shape of each extruded ring. Extrusions on this job cut ring costs as much as 70 per cent

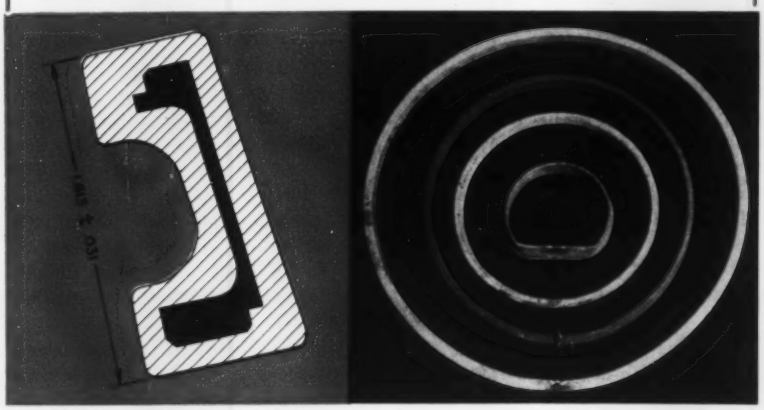
SAVINGS from using steel extrusions in jet engine manufacture may be dramatic. One type of engine has 87 different rings in the compressor assembly.

In producing the above case, Solar Aircraft Co., Des Moines, Iowa, uses six stainless extrusions—two rim pieces and four inside rings. Extrusions are first roll formed into a circle, and the ends are flash welded. Then they're machined and welded into the final assembly.

Flange rings were produced from forgings and rectangular bars. Taking one 410 stainless ring as an example, here's how costs compare:

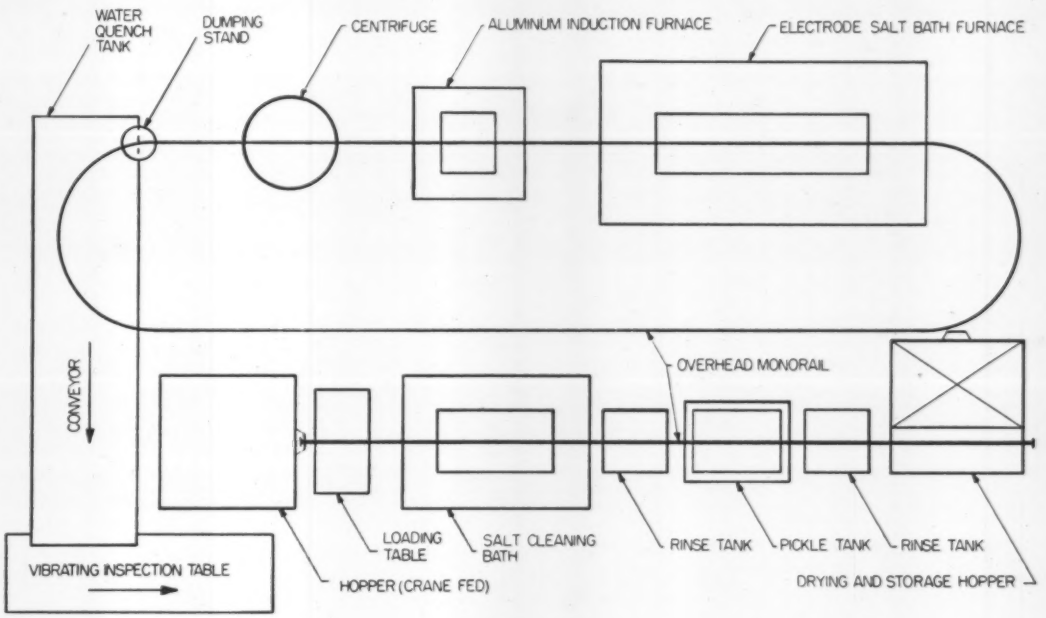
Forged Ring Stock	Rectangular Rolled Bar	Extruded Shape
$259.39	$146.26	$75.00

An additional $6 to $7 saving is realized with the extruded shape because of reduced machining time.



Cross section drawing shows original shape of the extrusion and the shape of the finished part (shaded area)

Extrusions are first roll formed into circles. Then the ends are flash welded. Next step is machining



Layout of equipment in Bethlehem's aluminum coating line

Aluminum Dip Coated on Steel Parts

Bethlehem Steel Co. has developed a practical, inexpensive process for applying the corrosion-resistant coat. Parts are preheated in fused salt before dipping

By R. F. JOY
Engineer, Research Department
Bethlehem Steel Co.
Bethlehem, Pa.

PRESERVATIVES have increased the life of wooden telegraph poles to 25 or 30 years, but in some localities, pole line hardware has to be replaced after 10 or 15 years.

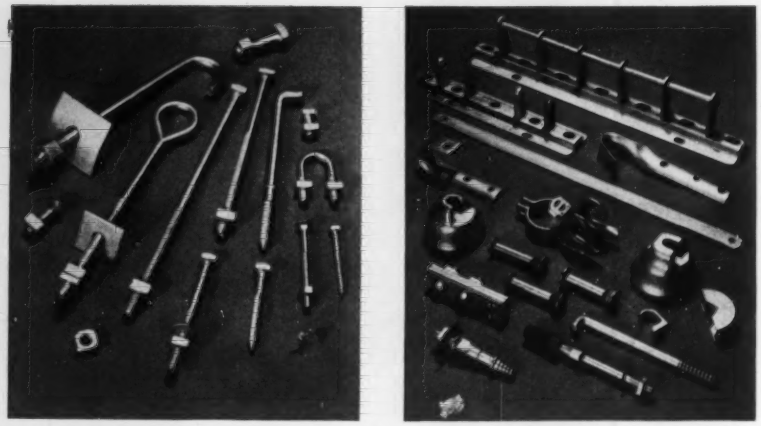
A 2½-year research program at Bethlehem Steel Co. has resulted in a method for commercially applying an aluminum coating to this hardware. The coating resists the severe atmospheric corrosion the hardware is subjected to.

Precleaning — Successful aluminum coating depends on a chemically clean surface. A fused salt (900°F) is the first step in Bethlehem's precleaning line. The salt burns off any oil or grease remaining on the part after an alkali degrease (which immediately follows manufacturing) and changes any forging or rolling scale to a form that can be readily removed by acid pickling.

From 200 to 250 lb of hardware are put in a metal basket and suspended in the cleaning salt for 5 to 15 minutes, depending on the amount of oil and scale. A rinse in cold overflowing water follows.

Pickling—Parts are pickled in 8 to 10 per cent sulphuric acid at 160 to 180°F. Pickle times range from 5 to 15 minutes, about half the time required for material not salt cleaned.

Following cold water rinsing, parts are dumped onto a vibrating conveyor which carries them into a steam heated drying and storage hopper. From this container, the cleaned and dried parts are loaded directly into the coating baskets. Small amounts of superficial rust that may form during storage are



Some of the products that have been coated

not detrimental to coating. However, there can't be any oil, grease or scale.

Furnaces — The preheating and fluxing furnace is an overhung electrode type of 200 kw capacity. There are five pairs of electrodes, each drawing 53 amperes at full load. Working space is 18 x 94 x 40 in.

The aluminum coating furnace is an induction unit of 35 kw capacity. The furnace draws 94 amperes on stand-by power and 170 amperes on high power. Working space is 24 x 24 x 42 in.

Centrifuge — The galvanizing centrifuge can be operated at variable speeds. A start-stop switch is in the lid. For rapid stops, a foot-operated mechanical disc brake is used.

A dumping stand and water quench tank complete the coating line. All coating baskets or racks are handled by overhead monorail.

Preheating — About 50 lb of hardware is loaded into a steel-mesh basket which is 12 in. in diameter and 15 in. high. The coating basket is suspended in the fused preheating and fluxing salt which is 1300 to 1350°F.

Six baskets can be loaded in the salt at the same time. Ropes from which the baskets are suspended are connected to an air-operated agitator arm which keeps the baskets in vertical motion as they pass through the furnace. This allows trapped air to escape and brings fresh salt into contact with each part. Time in the salt is 8 to 15 minutes.

Coating — After fluxing, the basket is quickly transferred to the aluminum furnace. The basket is pulled up and down a few times, breaking through the aluminum surface each time. Parts must be stirred if they are small and packed tightly in the basket.

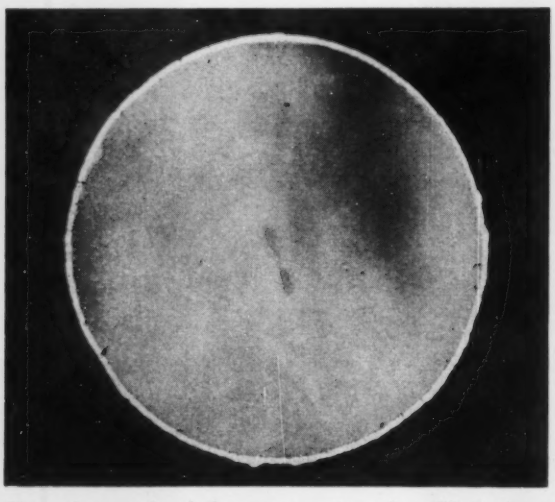
Aluminum temperature is maintained between 1290 and 1325°F. Immersion time is 1 to 3 minutes. Coating thickness is increased as immersion times and temperatures are raised. A coating of about 2½-mils (0.0025 in.) is customary.

Spinning — From the aluminum pot, the coating basket is rapidly positioned in the centrifuge. Spinning speed varies, depending on the product. Large, unthreaded parts are spun at slow speeds; small threaded bolts must be spun at higher speeds. Centrifuging times vary from 15 to 60 seconds.

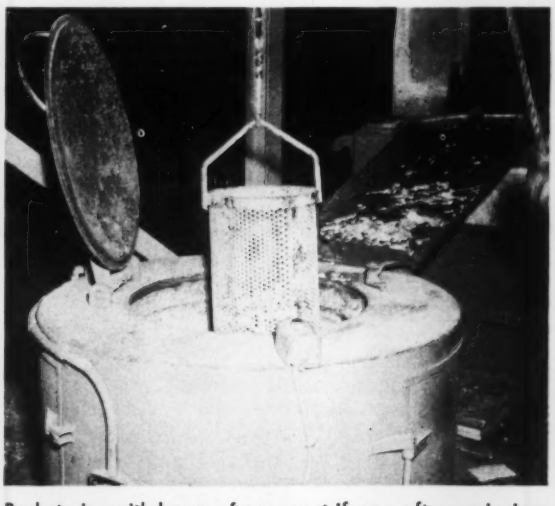
Most hardware is water quenched. The coating basket is placed on a dumping stand and its contents emptied directly into cold water.

Finished Product—The process produces excellent uniformity of coating. Bolts as small as 3/16-in. in diameter have been coated and spun clean. However, because of handling difficulties of such small parts, bolts ¼-in. in diameter usually are considered the lower limit for successful coating.

Due to equipment limitation, a length of 38 in. is considered maximum, although longer lengths have been coated experimentally.



Photomicrograph of the cross section of a CB insulator pin which is ⅝-in. in diameter. Note uniformity of coating



Basket is withdrawn from centrifuge after spinning. Centrifuging speeds vary, depending on the product

Duplicate holes Automatically!

with the WALES FABRICATOR-DUPLICATOR

Punch accurate holes from any master template!

Holes in the template, mounted on the Duplicator, are automatically precision punched in the work piece . . . which is mounted on the Fabricator. Any size or shape hole within the limits of 3½" dia. can be handled on a quick change basis. Punch and die changes are made in seconds so that patterns with various size holes can be duplicated at high speed. This equipment is a complete punching shop in itself . . . fast . . . accurate . . . rugged and priced within the reach of any shop.

SEND FOR BULLETIN No. 25A

Time studies, specifications, illustrations etc., are all yours for the asking.

WALES MOBILE FIELD UNITS

We'll bring the Fabricator Duplicator right to your door for a demonstration. Ask for details.

WALES Strippit COMPANY

"...the Wales-Way is the PLUS-PROFIT way"

AKRON, NEW YORK

WALES-STRIPPIT OF CANADA LTD., HAMILTON, ONT.

- **Coke Plant**
- **Blast Furnace**
- **Open Hearth**
- **Soaking Pits**
- **Blooming Mill**
- **Finishing Mills**
- **Auxiliaries**

Planning Is Key to . . . Efficient Maintenance

Steel mills have their special maintenance problems. Anticipating repairs before they cause costly delays is the main responsibility of a maintenance man

"WE MUST think of maintenance as the most effective means of keeping plant machinery in continued production," says Fred M. Gross, superintendent of maintenance at the Ashland Works of Armco Steel Corp., Ashland, Ky.

He used those words to define maintenance's role in steelmaking at the 8th Plant Maintenance & Engineering Conference last week in Cleveland.

Design—Preventive maintenance must begin with the design of equipment. It must embrace those features that are conducive to sustained operation and also make allowances for the equipment to be dismantled for repairs. Well trained operating and maintenance crews are essential.

Equipment also must be installed in a proper manner and in a proper location. It is easier to avoid bad conditions during installation than it is later. Conditions such as dust, moisture, vibration, temperatures and hazards from outside sources should receive prime consideration in inspecting proposed installations.

High Standard — "Planned inspection is the key to a highly successful maintenance program," asserts Superintendent Gross. It keeps a supervisor informed on the condition of the plant's equipment, and when the information is properly used, it keeps maintenance standards high.

Follow-up insures full benefit from the inspection program. Routine repairs usually are made when the equipment is idle. When repairs demand more time, inspection reports serve as guides in meetings where the scheduling, operating, engineering and maintenance departments get together to lay plans for stopping operations long enough to make repairs.

Up Efficiency — Long range minor and major repair programs keep production loss at a minimum. They also minimize overtime pay and increase man-hour efficiency. This is made possible through ample job preparation.

You must have all necessary spare parts and materials on hand. You must have a good maintenance shop properly equipped with tools and men, and a shop scheduling system to co-ordinate the facilities of the shops with the needs of operations. The shop must have the diversity and flexibility to meet any emergency.

Storage—It is highly important to have good storage facilities serviced by adequate material handling equipment and complete records of all materials on hand or on order. Material records should be indexed to indicate equipment which is duplicated in different departments and might be serviced by the same spares inventory.

A good record of spares will avoid the cost of duplicating equipment and provide a way to locate the spare part when you need it.

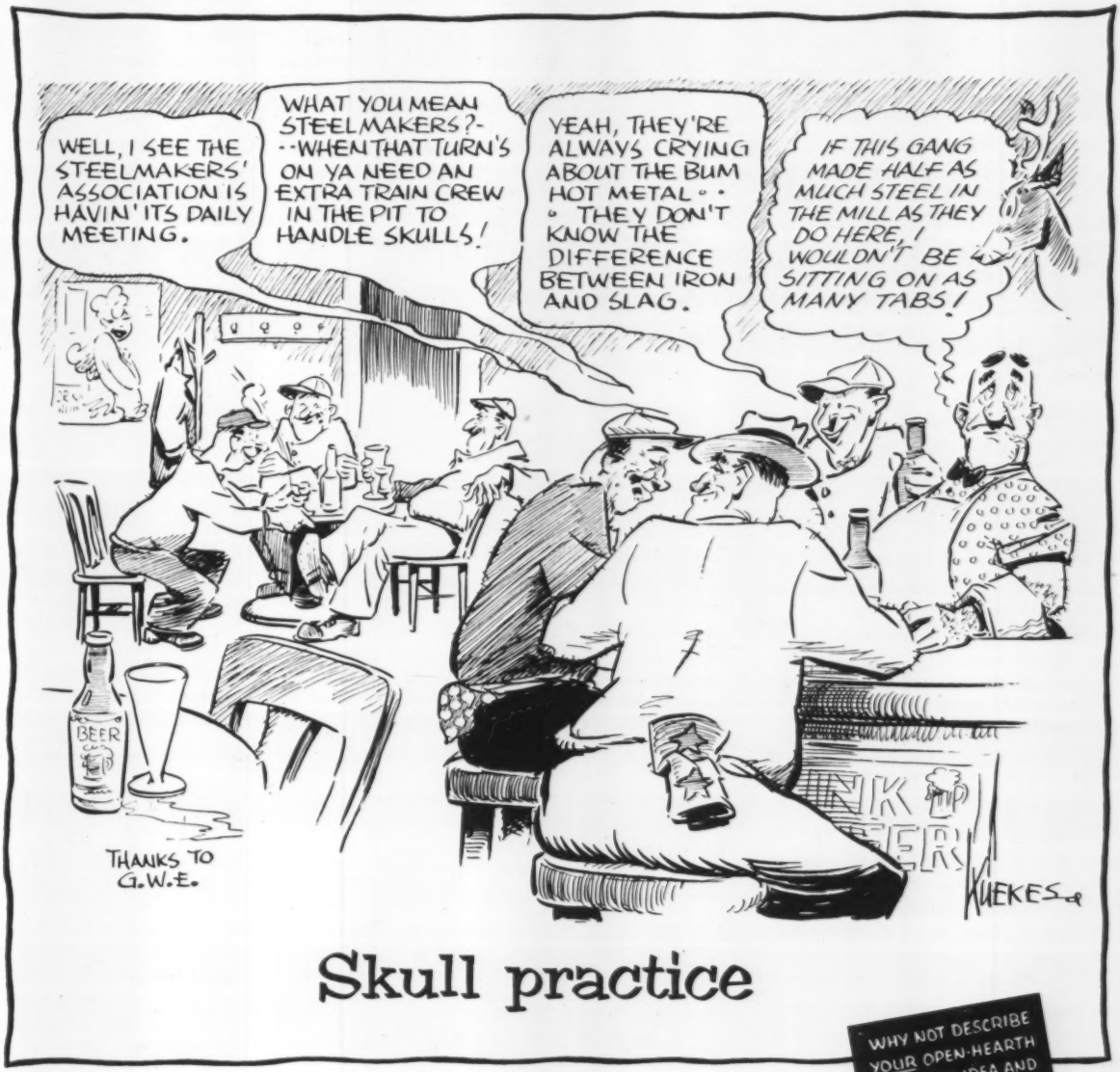
Problems—Steel mills have their special maintenance problems. Repairs must be anticipated and planned long in advance to keep down time at a minimum. Major repair programs are keyed to scheduled shutdowns of blast furnaces and open hearths and must keep the units operating over long periods.

Here is how Republic Steel Corp. handles its maintenance, as described by John R. Lowey, assistant superintendent, mechanical department of the Cleveland district.

Coke Plant—Maintenance is concentrated primarily on the material handling equipment. On the oven side of the plant, the chief problems are abrasion and dirt. In the by-product plant, the problem is the corrosive and flammable gases. A large force of pipefitters is kept busy.

Blast Furnaces — Periodically,

THE OTHER TURN


WELL, I SEE THE STEELMAKERS' ASSOCIATION IS HAVIN' ITS DAILY MEETING.
WHAT YOU MEAN STEELMAKERS?- --WHEN THAT TURN'S ON YA NEED AN EXTRA TRAIN CREW IN THE PIT TO HANDLE SKULLS!
YEAH, THEY'RE ALWAYS CRYING ABOUT THE BUM HOT METAL . . . THEY DON'T KNOW THE DIFFERENCE BETWEEN IRON AND SLAG.
IF THIS GANG MADE HALF AS MUCH STEEL IN THE MILL AS THEY DO HERE, I WOULDN'T BE SITTING ON AS MANY TABS!
BEER
THANKS TO G.W.E.
KUEKES

Skull practice

WHY NOT DESCRIBE YOUR OPEN-HEARTH CARTOON IDEA AND SEND IT ALONG TO US?

The benefits steelmakers obtain from our refractories are in part a result of Basic's on-the-job servicing. One of the rewards of this close relationship has been the opportunity to observe and appreciate the lighter side of these usually serious craftsmen.

BASIC INCORPORATED 845 HANNA BUILDING • CLEVELAND 15, OHIO

the furnaces are relined, stoves and power house equipment are checked and overhauled. Every part is put into first-class condition during the relines. Regular maintenance while the furnace is in operation must be done with an eye to the two primary hazards—gas and molten metal.

Some repairs can be done only with the furnace down. Shutdowns can be held to a minimum by doing not only the job that caused the stop, but any other job which might, if let go, force another stop in the near future.

Open Hearths—These units are taken off the line about every three months for repairs to brickwork, supporting steelwork and water-cooled auxiliaries. Co-ordination of the various crafts which work on the furnace is a prime requisite for a quick rebuild.

A lot of routine maintenance is devoted to material handling equipment—overhead cranes and chargers which have to be in shape at all times to handle the ladles of molten metal safely. Contactors and lubrication require special attention because of heat and dirt conditions. Air conditioning is becoming a must for operator comfort and must be maintained.

Soaking Pits—Pit cranes, which go into the heat of the pit for the steel, require steady maintenance. The repair of capings and walls gives masons a full-time job. Work on a pit crane must be done during periods of lower open hearth heat delivery or mill stops.

Blooming Mill—This mill, which today usually handles bigger ingots than it was designed for, needs constant attention. It is subjected to high heat, heavy impact and severe scale conditions. Rollers, shafts and other parts have to be replaced often; control of spares becomes an important part of the maintenance man's job. Inventory control is necessary because deliveries on bearings are long. Part needs must be anticipated.

Bar Mill — Tables and cooling beds often take the most maintenance. Lubrication is a must; automatic systems must be supplemented with regular inspection for proper lubrication. Mill furnaces, product shears, mill cranes and mill housings get regular attention. In the newer high speed mills, roll bearings and guides must be kept in good condition to get a good product.

Strip Mills—Roll bearings are the big maintenance job in the hot mill. They must be regularly inspected for signs of damage or wear. A careful record of tonnages rolled on each bearing must be kept so it can be moved down from high speed to low speed stands as it gets older.

In the cold mills, the problems are similar to those in the hot mills, but the need for precision workmanship is even greater with the added complications of rigid cleanliness to avoid marking or dirtying the cold rolled sheet. Most of the handling equipment and most of the many varied finishing units depend largely on hydraulic power. The complexity of the various hydraulic systems requires the training of a top flight mechanic.

Auxiliaries—The size of a steel mill makes the auxiliaries a big maintenance job. The blast furnaces have boiler houses and power stations; open hearths have waste heat boilers; there are pump houses to handle the millions of gallons of water used, and piping and sewers; there are gas holders, gas mixing stations and gas piping. The electric distribution system goes through the plant with strategically located substations. Other utilities include those for compressed air, oxygen, acetylene and sanitary water facilities. All require continual inspection.

The average mill has miles of railroad with rolling stock. Handling equipment includes track cranes, mobile cranes, shovels, bulldozers, highlifts, trucks of all kinds and even busses.

Another responsibility of the maintenance department is design and construction. Maintenance forces take care of shop fabrication and field installation. The maintenance man, through directing the construction, is sure the job is done right and knows what is required when repairs become necessary.

"Anticipating maintenance headaches before they cause costly delays is our main responsibility," explains Mr. Lowey.

Automatic Casting

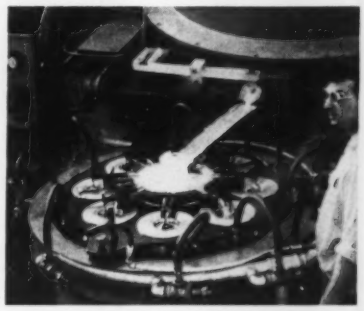
A compact, easy-to-operate machine can bring increased productivity to the foundry

A VARIETY of shapes, from round extrusion billets (solid or hollow) to rectangular rolling mill cakes and slabs, can be continuously cast in a new machine that handles most nonferrous metals.

Built by Lobeck Casting Processes Inc., New York, the unit will produce billets 3 to 20 in. in diameter, and will simultaneously cast as many as 20 multiple strands. Less than 1 per cent of the metal is lost as "gate" on the ingot top.

Operation—Hot metal for the continuous casting operation generally is obtained from induction or reverberatory melting furnaces feeding an induction or resistance heated holding furnace.

Metal is fed into the molds under automatic flow control which maintains a rate equivalent to the rate at which the solidifying castings move downward. The short length of the mold and its high thermal conductivity make for rapid solidification of the metal.



CASTING MACHINE

. . . producing eight 6-in. aluminum alloy extrusion billets

Water-Cooled — The molds are made of a special alloy and are internally cooled by water. The cooling water can be recirculated, so that only a small amount of make-up water is required.

On leaving the molds, the ingots are further cooled by controlled water sprays and then are immersed in a tank of water. Water level in the tank is controlled.

After the pour is completed, the mold supporting ring is swiveled aside about its pivot support, permitting easy access to the solidified ingots in the tank.

POP'S school of filing

CLEM DON'T BELIEVE POP WHEN HE SAYS THE NICHOLSON FOLKS MAKE 12 PERFECT FILES IN EVERY DOZEN
POP SAYS WAIT TILL HE USES A COUPLE OF DOZEN. THEN HE'LL KNOW!
SR

12 PERFECT FILES IN EVERY DOZEN • 12 PERFECT FILES IN EVERY DOZEN • 12 PERFECT FILES IN EVERY DOZEN • 12 PERFECT FILES IN EVERY DOZEN • 12 PERFECT FILES IN EVERY DOZEN • 12 PERFECT FILES IN EVERY DOZEN • 12 PERFECT FILES IN EVERY DOZEN • 12 PERFECT FILES IN EVERY DOZEN • 12 PERFECT FILES IN EVERY DOZEN

NICHOLSON U.S.A.

NICHOLSON FILE COMPANY, PROVIDENCE, RHODE ISLAND
(In Canada: Nicholson File Company of Canada Ltd., Port Hope, Ontario)

BLACK DIAMOND U.S.A.

NICHOLSON FILES *A FILE FOR EVERY PURPOSE*

Samples of brass, aluminum and plastic shafts made on Clarotsat's screw machines

Bar Feeds Boost Output

PRODUCTION of shafts for electronic volume controls and resistors has been boosted by one-third at Clarostat Mfg. Co. Inc., Dover, N. H.

Improvements came through the systematic use of setup tools, well laid-out bar stock racks and automatic screw machines whose air-operated bar feeds continuously supply stock for periods up to 8 hours.

Screw machine production is geared to meet job requirements of customers. An average run is 10,000 parts; this means setups have to be changed three or four times daily. Quick setups and high volume output must be maintained without jeopardizing adequate inspection of parts.

Service Team—To achieve this, a six-man team services the screw machine production area. It includes a foreman, his assistant, three setup operators and a stock boy.

The area is subdivided into three work bays: A setup assembly and tool storage crib, a stock bar storage bay and the machine bay. Ten automatic screw machines—eight equipped with Lipe AML pneumatic bar feeds and two with feed fingers—turn out aluminum, brass or plastic shafts for the firm's electronic control devices.

Planning — At the end of the day, bar stock for the Lipe-equipped screw machines usually is loaded for the next day's runs. At the same time, the foreman or his assistant plans the next day's setups, based on job orders from the floor superintendent.

Job orders are ticketed to a board which is numbered to denote the order in which the jobs are to be run. Necessary setup tools for each job are placed into small tote boxes, which also are numbered to correspond with the ticketed job order.

Stock Storage — Bar stock and tubing are consumed in large quantities (20,000 lb of brass rods, 2000 lb of brass tubing and 5000 lb of aluminum rods per month).

To handle this, storage racks are placed at opposite ends of each screw machine bay, enabling the stock boy to load the magazines of the pneumatic bar feeds without interfering with the activities of the setup operators.

Man-hours Cut—The job order system at Clarostat, supported by the pneumatic bar feeds also has reduced production and man-hour costs.

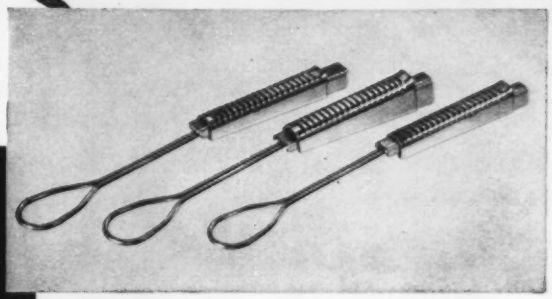
Before the pneumatic feeds were introduced, nine men, including the foreman, were necessary to hand feed the battery of ten automatic screw machines. Production was 380 pieces (average length, 1⅛ to 2½-in.) an hour.

Production Up—After eight machines were equipped with the bar feeds, production jumped to 500

Racking bar stock on one bay of Lipe AML bar feeds. Loadings usually are made at the end of a shift

SUPPORT FOR VOICES

Photo, courtesy Reliable Electric Company, Chicago. All needs for supporting telephone drop wires are met by these 3 all-stainless steel clamps.



How the New 200 Series from THE HOUSE OF STAINLESS Provides Universal Answer for Supporting Telephone Lines

THE NEED The clamps required to support insulated telephone drop wires must give at least 25 years of trouble-free service in all climates and under the most severe conditions. Reliable Electric engineers were not completely satisfied that the non-ferrous materials previously used to produce these clamps, provided all the strength, durability and corrosion resistance it was possible to obtain. Also, they hoped to avoid having to use different materials to meet varying conditions in different areas.

THE ANSWER One type of the new 200 Series stainless proved to be the practical answer for all sizes of these clamps. Here was a material with strength and rigidity to spare to combat constant tension and wear. It assured the corrosion resistance to withstand any climatic conditions including service in the coastal areas. It promised dependable performance far beyond the service life expected. It was readily available. Moreover, Reliable found this stainless workable with negligible changes in existing tooling. And, equally important, all these benefits gave them a superior product at no additional cost.

The House of Stainless is more than just a source of supply. If you are not already using stainless, our metallurgists will be happy to explore its possibilities of improving your products and production. To stainless users, this service is valuable in making sure that full benefits are being realized from this superior metal. The House of Stainless backs up this service with complete warehouse stocks for immediate shipment and mill deliveries through our mill placement department.

Just phone Lafayette 3-7210

The House of Stainless

STEEL AT YOUR SERVICE

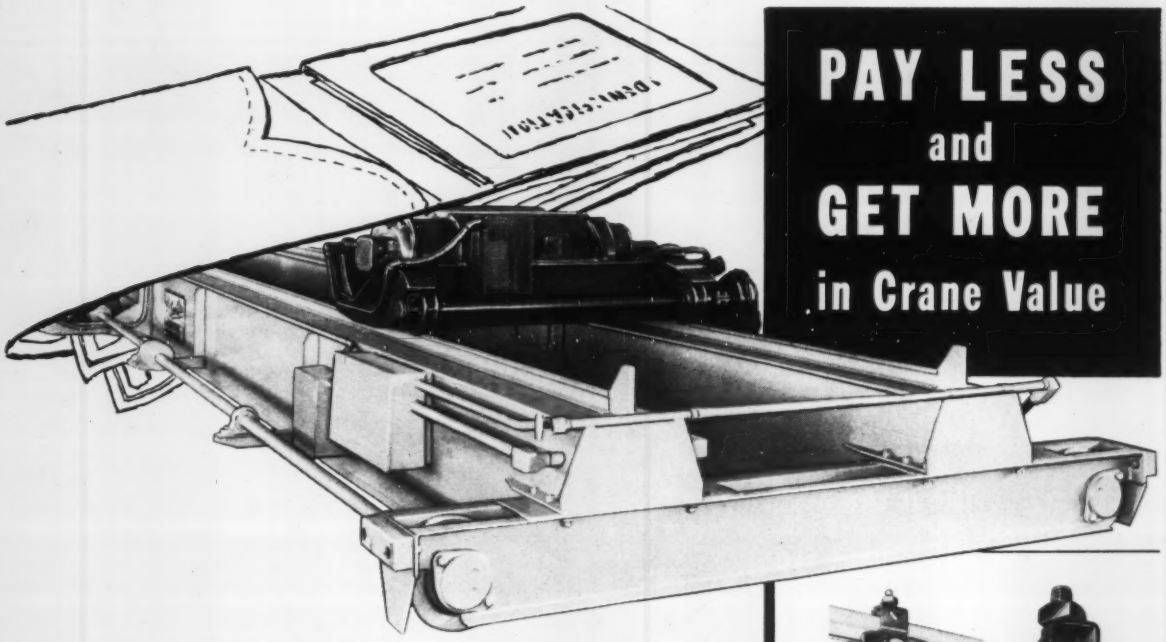
CHICAGO STEEL SERVICE COMPANY

Kildare Avenue at 45th Street, Chicago 32, Illinois Mailing Address—Box 6308, Chicago 80, Illinois

Milwaukee District Office: 757 N. Broadway, Milwaukee 2, Wisc. Telephone BRoadway 3-7874

Sales Representatives at Bloomington and Rockford, Illinois; Indianapolis and South Bend, Indiana; Cedar Rapids and Davenport, Iowa; Grand Rapids, Michigan; Minneapolis, Minnesota; Appleton, Wisconsin.

YOUR DEPENDABLE SOURCE FOR BOTH CARBON AND STAINLESS STEEL

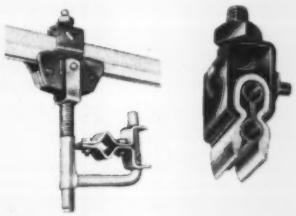


PAY LESS and GET MORE in Crane Value

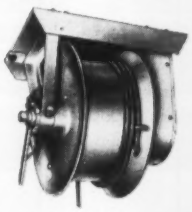
Series "D" 'Load Lifter' Cranes cost less than other brands available for average industrial service. They can be priced substantially lower for two reasons: 1) the use of highly standardized components and 2) mass production methods. More value is built in: they have a combination of design and construction features you would expect only in the most expensive cranes. These features assure completely dependable crane service plus low power consumption and economical maintenance.

Series "D" Cranes operate smoothly. Needless dead weight is engineered out and anti-friction bearings are engineered in wherever practicable to eliminate drag and retard wear. All gearing operates in oil. Comparatively low headroom is combined with high hook lift. The double braking system makes load control accurate and easy. Positive magnetic control is provided for floor and cage controlled types. A three-girder bridge is standard for spans under 40 feet; box-section welded girders for spans up to 80 feet. No whipping or skewing.

Series "D" Cranes fit the job — and your pocketbook. Capacities range from 1 to 20 tons. Selection is easy. No complex calculations. Write for Catalog 221. Then pick out the size, type, trolley style, span and other requirements and place your order.



INSUL-8-BAR CONDUCTOR SYSTEM. A low-cost, flexible system. Enclosed, insulated. Always dependable, indoors or out. Assures complete safety, higher plant efficiency, lower maintenance costs. Trolleys are shoe type. Easy, fast and inexpensive to install, with simple tools. Write for Bulletin M83.



"SHAW-BOX" CABLE REEL. Constructed to eliminate spring breakage. Automatically keeps insulated conductor cable taut. Used on crane and hoist magnets, on soaking pit carriages, rolling mill machinery, machine tools. Available with 50 and 90 lb. pull; drums to wind up to 120 ft. of cable. Write for Bulletin 368.

57D-5

MAXWELL MANNING & MOORE INC. M&M TRADE MARK

'Load Lifter'® CRANES

MANNING, MAXWELL & MOORE, INC.

SHAW-BOX CRANE & HOIST DIVISION

384 West Broadway • Muskegon, Michigan

Builders of "SHAW-BOX" and 'LOAD LIFTER' Cranes, 'BUDGIT' and 'LOAD LIFTER' Hoists and other lifting specialties. Other Divisions produce 'ASHCROFT' Gauges, 'HANCOCK' Valves, 'CONSOLIDATED' Safety and Relief Valves, 'AMERICAN' and 'AMERICAN-MICROSEN' Industrial Instruments, and Aircraft Products.

In Canada: *Manning, Maxwell & Moore of Canada, Ltd., Avenue Road, Galt, Ontario*

an hour for the same size shafts.

Also, the manpower necessary to service the ten units was cut to six men. Three were reassigned to secondary machining operations.

Advantages — The air-operated feeds decreased feed cycle time by allowing longer lengths of bar stock to be fed in the same cycle interval. Formerly, using feed fingers, only 1 in. of stock could be fed in one-fourth of a second.

With the Lipe bar feed, 3 in. of stock are fed in the same amount of time. By making a minor adjustment to the screw machine, any length of stock can be fed.

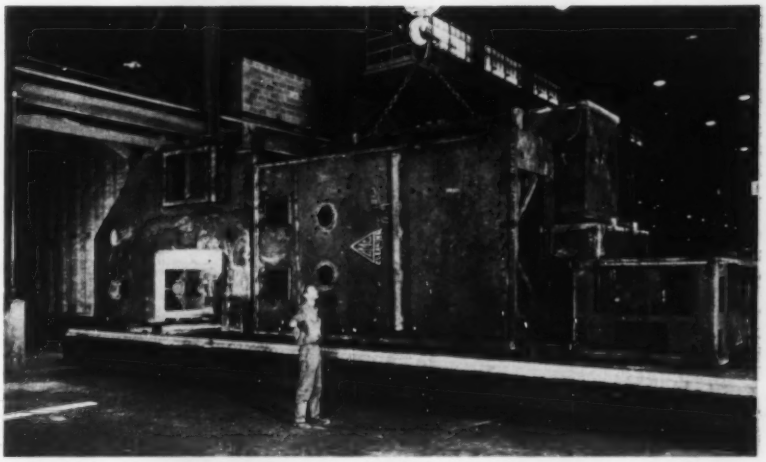
No Dead Runs—Through continuous loading, cutting air has been eliminated. To achieve high volume output with feed fingers, the operator had to be at the screw machine ready to load a new bar and remove the remnant.

Feed fingers and feed pads are unnecessary. Marred stock no longer is an inspection problem or requires secondary grinding. Machine operators are left free to devote more attention to tooling, inspection and maintenance.

Work—Cut from 12-ft lengths of brass or aluminum bar stock, 1⅛ to 0.251 in. in diameter, finished shafts are 1⅛ to 4 in. in length.

Machining operations differ from simple forming and cutting-off round bar stock to burring, threading, chamfering, tapping and drilling 0.318-in. diameter hex stock.

Assistant foreman jobs out the next day's setups. Plastic tote boxes, containing necessary tools, are ticketed to correspond with job order on nearby bulletin board



A 180-ton load of welded press parts is about to enter the annealing furnace (left). Door is moved horizontally by motors

Large Furnace Aids Pressmaker

Large weldments which must withstand heavy stresses are annealed more quickly and efficiently by a furnace big enough to handle them. This one features a tapered sand seal

ONE of this country's largest pressmakers, Clearing Machine Corp., a division of U.S. Industries Inc., Chicago, has a new, 200-ton, gas furnace for annealing its outsized weldments like those illustrated.

It can handle parts as large as 42 x 16 x 14 ft.

Less Wear—One of the outstanding features of the furnace is a tapered sand seal. In most furnaces, the seals drag through the sand for the length of the furnace. In this one, it locks in only for the 2 ft of car travel, minimizing wear.

Clearing makes its press frames from welded steel plates. Many smaller parts, like gears, brackets, cylinders and pillow blocks also are weldments.

Welding sets up stresses which must be relieved before the assembly can be machined. Parts subjected to severe stresses must be free of internal strains. The new furnace increases the efficiency of Clearing's annealing process by heating large parts more uniformly.

Controls—The annealing cycle is automatically programmed. Cam operated Brown pyrometers provide two zones of control. Safety includes automatic gas cutoff valves with manual reset. Cycles can be varied to reach the maximum of 1250°F at heating rates of 25 to 200°F per hour.

Heat is provided by 30 burners which are operated with excess air supplied by a centrifugal 30-hp blower. It delivers 4200 cfm to the burners which have 24.4 million Btu an hour maximum output.

The burners fire across a perforated arch. Four fans beneath the arch distribute heat evenly along the sidewalls to flue openings which are at the car hearth level. The top is vented through a collection duct by a forced air fan. Inside pressure is positive at all times.

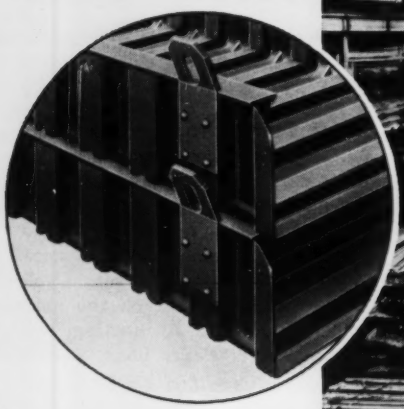
The furnace was designed and installed by Lindberg Industrial Corp., Chicago.

BEFORE AND AFTER PICTURES PROVE...

REPUBLIC BAR CARRIERS

BEFORE Republic Bar Carriers, materials were piled wherever space allowed. Handling operations were impeded. Inventory control was practically impossible.

AFTER Republic Bar Carriers were installed, materials could be handled quickly and easily. Valuable floor space was saved. Materials became easily accessible.



CARRIERS are equipped with crane-handling lugs which also permit stacking. Corrugated steel construction provides strength, assures long service life at lowest per-year-cost.

REPUBLIC

REPUBLIC STEEL

World's Widest Range of Standard Steels

save space, speed handling, make materials easily accessible

SAVE SPACE with Republic Steel Pallet Racks. They provide a practical, economical way to palletize and stack bulky, uneven, fragile materials. Tubular steel supports adjust every six inches to handle palletized material of any height. Two-way entry permits loading and unloading from either side. Select single pallets from any level without restacking. Send coupon for complete description, specifications and quotations.

Before Republic P-135 Bar Carriers went to work in this plant of a nationally known manufacturer*, materials of varying sizes and types were piled up just as they were received on shipment. To move a specific item to the production area required many handling operations. It was both costly and time-consuming.

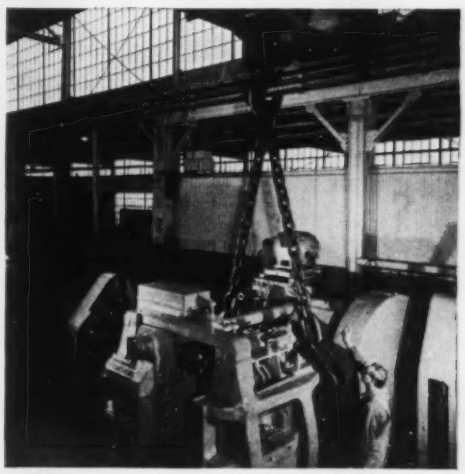
Then the company purchased and put to work a battery of Republic Bar Carriers. These units are ideally suited to handling groups of various size materials with lengths longer than the carrier.

Note in the "after" photo how materials are efficiently separated according to size and type. There's no inventory problem here now. Note, too, how tiering of the carriers saves space. Open-end construction permits easy accessibility to items at any spot in the tier—whether at top or bottom.

These units can also be used to advantage in handling pipe, tubing, angle irons, reinforcing rods, mouldings, extrusions, narrow-width sheets and plates, and many other materials characterized by narrow dimensions. Length, width and height of Republic Carriers can be designed to meet your specific requirements.

The Republic P-135 Bar Carrier may be the solution to your handling problem. Or you may require the design of a completely new unit. Our engineers will help you without obligation. Contact your Republic Materials Handling Representative for more information. Or mail the attached coupon.

**Name on request.*



SPEED HANDLING of heavy, bulky materials like machinery with Republic Chain Slings. They are made to your requirements in Alloy Steel, High Test Steel and Wrought Iron. All are proof tested and warranted to meet or exceed specifications. Because each grade of material has advantages over the other, depending upon application, we recommend talking over your requirements with a Republic Chain Engineer. Send coupon for more data.

REPUBLIC STEEL CORPORATION
Dept. C-2826
3120 East 45th Street
Cleveland 27, Ohio

Send more information on:

☐ P-135 Bar Carriers ☐ Chain Slings ☐ Pallet Racks

☐ Have a Materials Handling Engineer call.

Name_____ Title_____

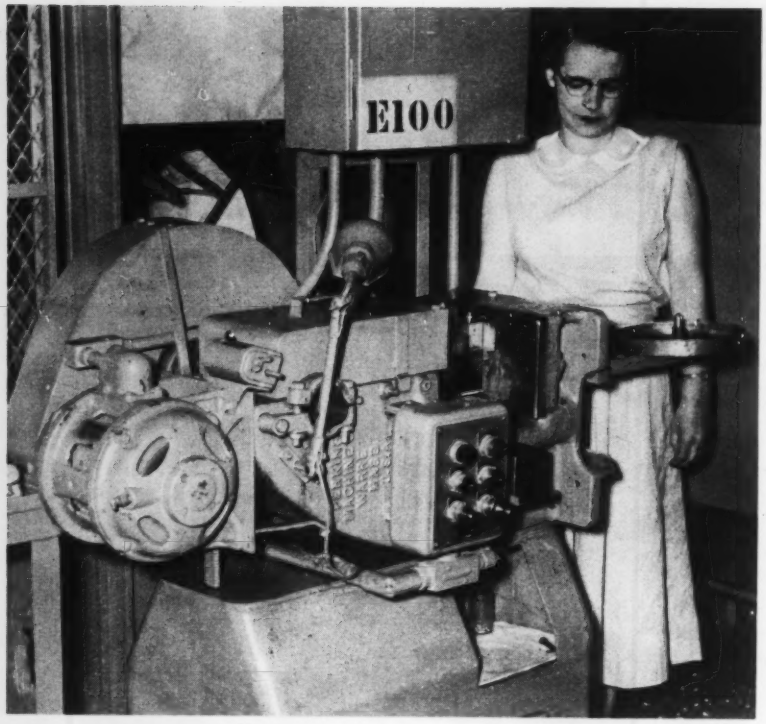
Company_____

Address_____

City_____ Zone____ State_____

STEEL

and Steel Products



Example of a special machine made with a standard punch press. Placed on its back on a fabricated base, it forms spark plug center wires from the platinum wire held in the spool next to the operator

Factors To Consider in Design

The Special Machine

When to use a special machine and why. Here are some factors to consider before and during design; recommended practices and some short cuts

WHEN should you use a special machine tool?

Here's what the AC Spark Plug Division of GM does to find out where special machines are needed, where to use them and why.

Defined—A special is any machine designed to do one or more operations on a specific part or parts. No standard will do exactly the same thing. The special can be designed and built from the base up, or it can be a converted standard.

You use a special when you can replace a large number of operators doing the same operations.

There are four reasons: To save labor, increase production, improve quality and working conditions.

Most specials save labor and increase production.

Investigation—Weigh the facts carefully. Automatic machinery will produce more consistent quality faster than manual systems. Automatic controls are stable, reliable and fast. They don't take a coffee break.

But don't forget: An operator can judge, reason and anticipate. A strange noise will warn him of trouble. Maintenance or setup men will have time to make corrections before trouble gets out of hand.

Before you go too far, compare costs: The special versus the best hand methods.

Incidental benefits: Investigation may uncover poor layout, excessive material handling, even lack of work study.

Design—An automatic, special machine can be designed for one operation, multiple operations or a complete department. How far you go depends more on long run

- How big will it be?
- Are there layout restrictions?
- How long before savings pay off?
- Will you use rotary or trunnion type with hoppers or feeders; or in-line, transfer types?
- What is the flow of materials?
- Is skilled or nonskilled labor required?
- Does your plant have the know-how in electronics, hydraulics, automation?
- Will product design change before the machine is amortized?
- Have you anticipated needs by projecting production schedules?
- Can the machine be designed to accommodate other parts?
- Have you anticipated changes in plant layout?
- Can one operator run two or more machines?
- Have you figured the cost of new utilities — conveyors, transformers, power equipment, etc.?
- Do you know your materials — machinability, quality, etc.?
- What about safety features?

returns than initial cost. A proposal with several economic evaluations is a must.

After you have decided what the machine will look like and how many operators will be needed, the next step is to make a plan view layout showing the spacing of the stations and the work areas in correct sequence. If it is a line machine, a few spaces may be left open for design changes. This is more difficult to do with a rotary type.

Indexes—There are many types of indexing mechanisms to choose from. Most are cataloged. Indexing units for rotary-type special machines vary from a simple air cylinder or motor-driven ratchet to a precision Geneva or roller gear cam unit.

One of the most successful units for rotarys consists of a harmonic motion output cam (motor driven) and a ratchet pawl. Indexing is done on the spring return portion of the cam to prevent damage from a machine jam.

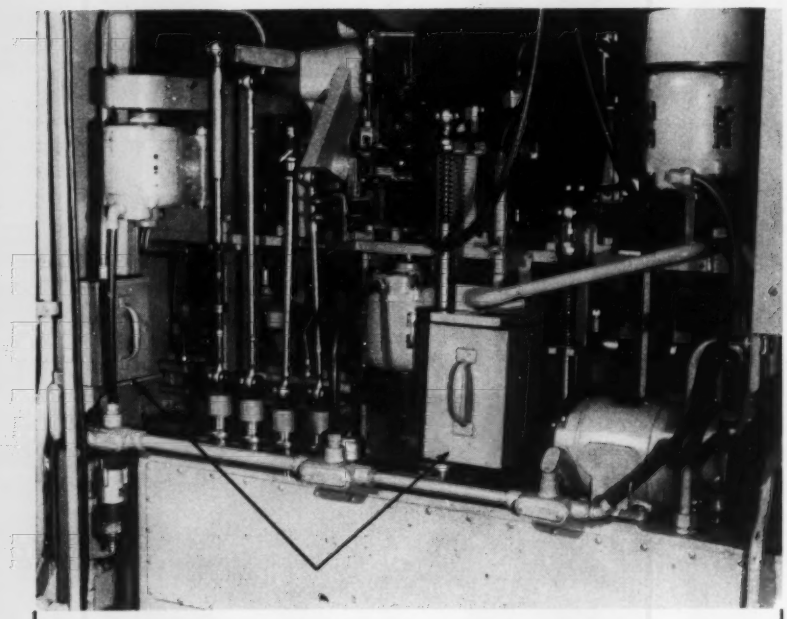
Fluid motor drives are good on the larger rotary tables where hydraulics are used.

In one of the AC Spark Plug plants, a small in-line machine uses both the cam-operated index and a roller gear and cam unit.

Base—The importance of a firm foundation for the machinery shouldn't be underestimated. On expensive machines, doors, shelves, etc., are provided as a matter of course. On the smaller, less expensive models, open angle and channel iron structures are adequate.

Plastics are getting increased attention for dress-up applications. Glass fiber reinforced types are easy to mold, easy to work and

When can you use a special machine? When you can replace a large number of operators doing the same operations. Here, two rows of operators assemble fuel pump valves manually. Assembled valves are placed on the conveyor, so that the nearest operator at the press can crimp them. Inset (left) shows one station. The special assembly machine in the top illustration has output equivalent to more than three operators



This is how chips are handled in the spark plug shell machine. The three machining stations are kept free of chips by air pressure which forces the chips past the tool and through the tubes into the two containers shown.

Before cutting begins, the tubes enclose the cutting tools and the parts—all chips are forced into the tubes. The system works successfully only on light chips; heavier types require other methods.

Chip control is important in the base design of a special machine. Dimensional accuracy depends a great deal on chip clearance. Chips must be kept off cams or rollers, and they must not be allowed to pile up and interfere with indexing mechanisms or other moving parts. This applies especially to locating pads and pins.

stand a great deal of abuse (STEEL, Jan. 30, 1956, p. 102).

Be sure to design the base for easy access to cams, rollers, gears or any other mechanisms. Include provisions for leveling as well as lagging to the floor. Don't forget that operators are seldom 6 ft tall. Fatigue is a big cost factor.

Cams or Cylinders — There is much disagreement about cams and cylinders.

The cylinder is the easy way out. It is flexible in speed and force changes. Incompetent setup men and operators who fuss with machine settings can make flexibility a liability.

When the designer can fix the speeds and feeds, it's better to specify cams. Be sure to consider the cost of utilities like compressed air.

Catalog Units—With the wide variety of units offered by several reliable firms (drill and tapping heads, power units, clutches, etc.), you should be able to avoid trick mechanisms. If a new idea is involved, build a complete station for tryout before adding the design to the main machine.

Miscellaneous — Don't try to make a one-man job out of special machine design. Get the assistance of metallurgists, electronics engineers, hydraulics, methods and lubrication people, etc. Few designers have all the skills and knowledge needed for most special machines.

Here are some other essentials:

1. Specify only stock valves, switches, seals, etc.
2. Provide for quick, easy removal of tools.
3. Tracks and feeding devices must clear easily when jammed.
4. Checking stations are desirable. This includes gaging for rough parts, between operations and finished parts.
5. All sides of the machine should be accessible for service.
6. Provide automatic unloading, even packaging, if possible.
7. If the machine is hand loaded, put hoppers and chutes within hand and arm movement areas.
8. Use a central lubrication system.
9. If the machine is made outside, be sure to specify everything to avoid expensive misunderstandings.

Preventive Maintenance—This is the most important single item. Instead of relying on the maintenance department, draw up specifications for a program and teach the maintenance men to follow it. Changes can be made to fit experience.

Lubrication schedules are an important component of such a plan. Overlubrication has ruined many an electric motor. One company maintains that 85 per cent of its equipment breakdowns are due to faulty maintenance.

Release—When machine tryouts are completed, teach foremen and operators how to run it. You'll get better quality, greater efficiency and longer life. Management will be happier with the results.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, O.*

MORE OF THE GARLOCK 2,000

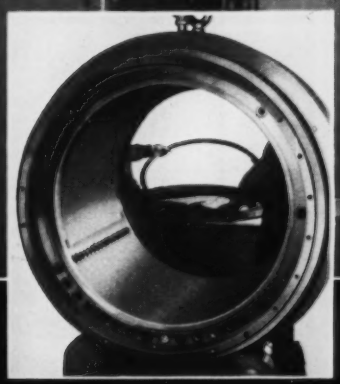
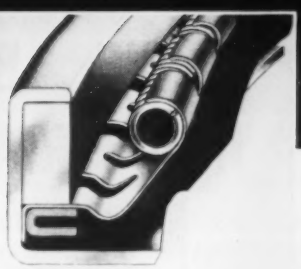


Photo shows roll bearing in foreground with KLOZURE Oil Seal and retainer ring removed. In background a new KLOZURE Oil Seal is quickly inserted in retainer ring.

YOUNGSTOWN Equips Hot Strip Mills with Garlock KLOZURE* Oil Seals . . . SAVES OIL and MAINTENANCE TIME



Cross section of Model 64 KLOZURE Oil Seals used on back-up rolls of steel mills.

Nine back-up rolls on the Hot Strip Mill illustrated have been equipped by Youngstown Sheet & Tube Company with 72 Garlock KLOZURE Oil Seals. The rolls run at speeds of 1025 ft. per min. Oil pressure is approximately 8 psi. at temperatures to 120° F.

Youngstown is able to roll a half a million tons of steel on this Mill before the KLOZURE Oil Seals need replacement. Furthermore, considerable maintenance time is saved when replacement seals are applied.

Also, a large percentage of oil has been saved due to the application of Garlock KLOZURE Oil Seals.

If you have an application that requires oil seals, why not investigate the advantages of KLOZURE Oil Seals. They are another important part of "the Garlock 2,000" . . . two thousand different styles of packings, gaskets, and seals for every need. It's the only complete line . . . that's why you get unbiased recommendations from your Garlock representative. Call him or write for KLOZURE Catalog.

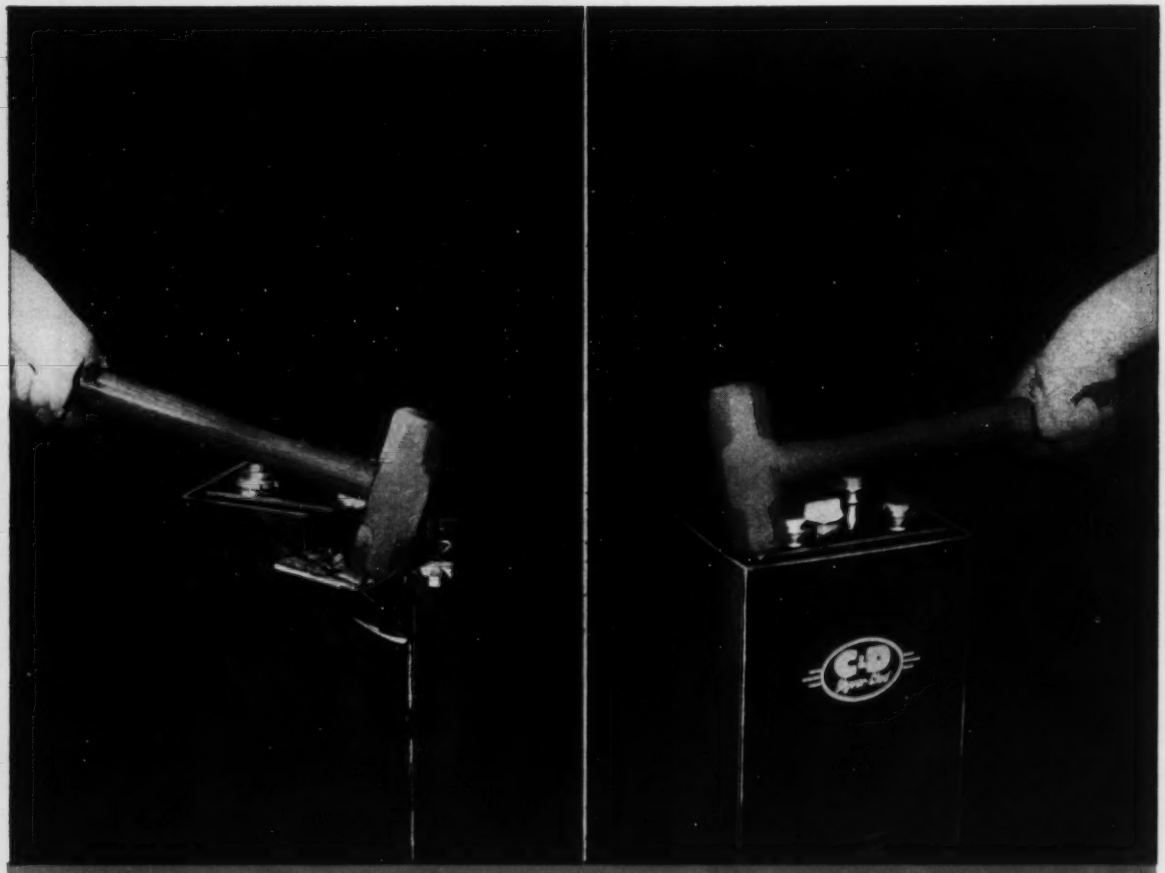
THE GARLOCK PACKING COMPANY, Palmyra, New York

For Prompt Service, contact one of our 30 sales offices and warehouses throughout the U.S. and Canada.

**Registered Trademark*

GARLOCK

Packings, Gaskets, Oil Seals, Mechanical Seals, Rubber Expansion Joints



See the difference! The battery cell on the left with a container and cover made of present standard materials has been struck with a four-pound maul. Notice the smashing and cracking. C & D's Slyver-Clad cell, with the container and cover made of new, exclusive C & D *Hi-Impac* compound was struck the same way—without a sign of breakage! Imagine the damage to truck batteries prevented, and the resulting time and money saved on repairs with batteries made of C & D's new *Hi-Impac* material.

NOW...BATTERY BREAKAGE IN ELECTRIC INDUSTRIAL TRUCKS VIRTUALLY ELIMINATED

...with new C&D *Hi-Impac* cell cover and container!

New C & D *Hi-Impac* material for cell covers and containers for industrial storage batteries was developed jointly by C & D's research department and those of the major rubber companies. Thoroughly field tested, the *Hi-Impac* material virtually eliminates the danger of cell container and cover damage by dropping, collision between trucks, or from the impact of heavy objects falling on the battery. Thus, C & D *Slyver-Clad*® batteries with the *Hi-Impac* containers and covers practically never have to be shopped for cell replacement or repair due to cracked or broken containers and covers.

All sizes of C & D's famous, Five-Fold *Slyver-Clad* batteries are now made with exclusive *Hi-Impac* material. Now with C & D batteries you not only get extra-capacity in a standard size tray; you also get *Hi-Impac* cell covers and containers that virtually eliminate breakage. It's one more reason why—

C&D is your best battery buy!

For details and specifications on C & D *Slyver-Clad* batteries with *Hi-Impac* cell covers and containers for electric industrial trucks and motorized lift trucks, write for Bulletins IT-524/56 and IT-525/56.

C&D

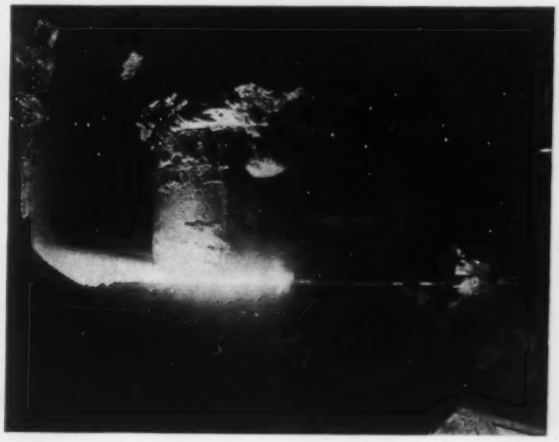
BATTERIES, INC.

of Conshohocken, Pa.

SINCE 1906

SALES AND SERVICE OFFICES IN PRINCIPAL CITIES FROM COAST TO COAST

Blowpipe Enables One Man To Remove 400,000-Lb. Risers



In a single pass, the C-63 blowpipe can cut through steel 55 in. thick. Greater thicknesses can be cut in multipass operations. One worker can remove 20 to 400,000-lb risers without moving the casting.

Auxiliary preheat is not needed because the blowpipe applies a tremendous amount of preheat to the surface to be cut. Separate hoses are used for preheat and cutting oxygen.

In relation to center line of the blowpipe, the nozzle is off-center. The operator can widen the kerf uniformly by rotating the blowpipe. Once the kerf is widened, the blowpipe itself can be inserted into it to deepen the cut.

The length of the blowpipe can be altered to match job requirements. *Write*: Linde Air Products Co., a division of Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y. *Phone*: Murray Hill 7-8000

Space Heaters Use Induced Draft Burners for Gas or Oil

The 1957 series of Counterflo direct fired, forced air heaters has nine sizes. Capacities range from 250,000 to 2 million Btu an hour.

A Pyro-Jet burner is used for gas, light oil, heavy oil or combination gas and light-oil firing.

The combination-fuel models feature instant fuel change-over. A dual preheating system is used for firing No. 5 fuel oil.

The air heater has two separate basic components. The furnace section has an induced draft burner, stainless steel combustion chamber of airfoil design, secondary heat transfer tubes made of aluminized steel and electronic flame failure protection.

The circulating fan section contains low speed, double inlet fans which are curved forward.

Fan motor requirements (based on a 75°F rise) range from ½ to 7½-hp, depending upon the size of the heater. Air-heat ratios are 11,000 to 16,000 cfm per 1 million Btu per hour output. Minimum efficiency is 80 per cent.

Burners are of "ring and finger" design. Gas ports and oil nozzles on gas-oil models are arranged so the flame from one cannot affect operation of the other.

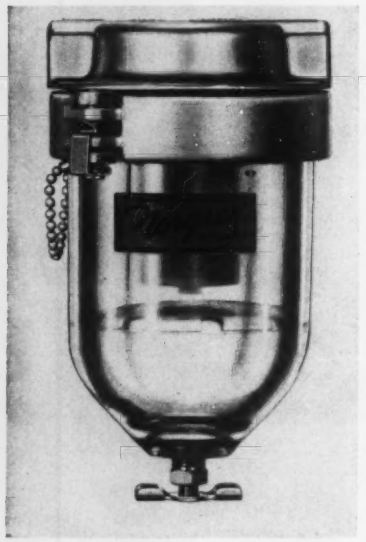
For firing No. 5 fuel oil, the burner uses air atomization and a dual preheating system which provides hot oil at the nozzle before the burner attempts to light off. Oil of a lower temperature is provided after the flame is properly established.

The exhauster fan draws in combustion air at the same rate spent gases are drawn out. *Write*: Dravo Corp., Neville Island, Pittsburgh 25, Pa. *Phone*: Spalding 1-1200

NEW PRODUCTS and equipment

Air Filters

Series 30AE filters are used with compressed air. Servicing is simplified by a clamp pin chained to the hinged-type clamp rings.



Louver plates provide an improved centrifugal air flow pattern. *Write*: C. A. Norgren Co., 3400 S. Elati St., Englewood, Colo. *Phone*: Sunset 1-5583

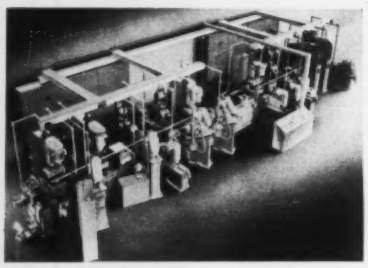
Tension Meter

This electric tension unit for wire mills flashes a warning light when tension goes above or below preset limits.

The instrument operates on 115 volts and is free from indefinite contacting and contact burn-out. *Write*: Tensitron Inc., Harvard, Mass. *Phone*: Gladstone 6-3511

Transfer Machine

Standard production units are used in this in-line transfer machine which turns out 480 carburetor bodies an hour.



The machine can be realigned easily for model changes, new models or other products requiring multiple drilling operations.

An automatic loading station checks parts and rejects those in improper position. The machine does 90 operations—31 drilling, 19 boring, 10 reaming, 4 gaging, 13 probing and 13 tapping.

The 25 standard units used in the machine have 56 stations. *Write*: Morris Machine Tool Co., 933-36 Harriet St., Cincinnati 3, O. *Phone*: Parkway 1-5616

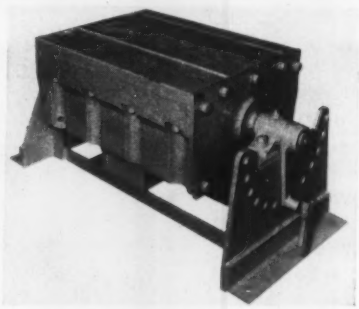
Cleaning Abrasive

Tumblex S is an aluminum oxide abrasive for barrel finishing. It comes in spheres of five different diameters.

The long-lasting spheres finish tubing, coil springs, scissor handles, bearing retainers, pump bodies and many other parts where conventional tumbling abrasive tends to wedge or will not reach. *Write*: Norton Co., Worcester 6, Mass. *Phone*: Pleasant 2-4641

Holding Magnets

These electromagnets hold odd-shaped castings securely in any position for grinding.

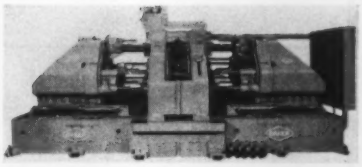


Tilting models permit locking the working surface up to 30 degrees in either direction. *Write*: Stearns Magnetic Products Division, Indiana Steel Products Co., 635 S. 28th St., Milwaukee 46, Wis. *Phone*: Evergreen 3-4800

Five-Station Machine

Automatic core drilling and reaming of 52 forged steering knuckles an hour can be done with this machine.

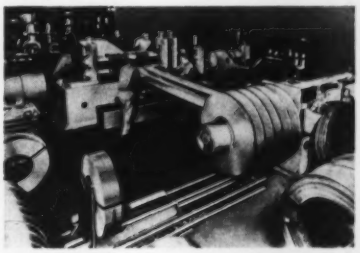
The drive units travel on flame-



hardened bar slides. Twin-pull cylinders for feed are on the outside of the slide. *Write*: Baker Brothers Inc., Toledo 10, O. *Phone*: Cherry 4-9511

Slitting Line

This 72-in. slitting line is tested to give trouble free service. The outboard bearing on the slitter is removed easily by a refined lead screw. Top and bottom mandrels are accessible for fast tooling changes and built for optional drives, either power or pull-through.

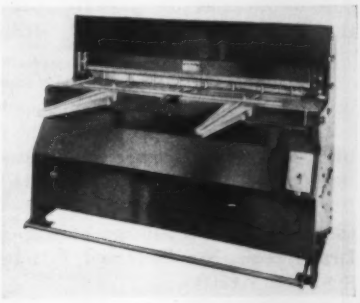


The uncoiler reel (cone-type) has adjustable tension control and automatic lateral adjustment. Threading motor of the reel is reversible. *Write*: Universal Gear & Machine Co., 1301 E. McNichols Rd., Detroit, Mich. *Phone*: Forest 6-2280

Squaring Shears

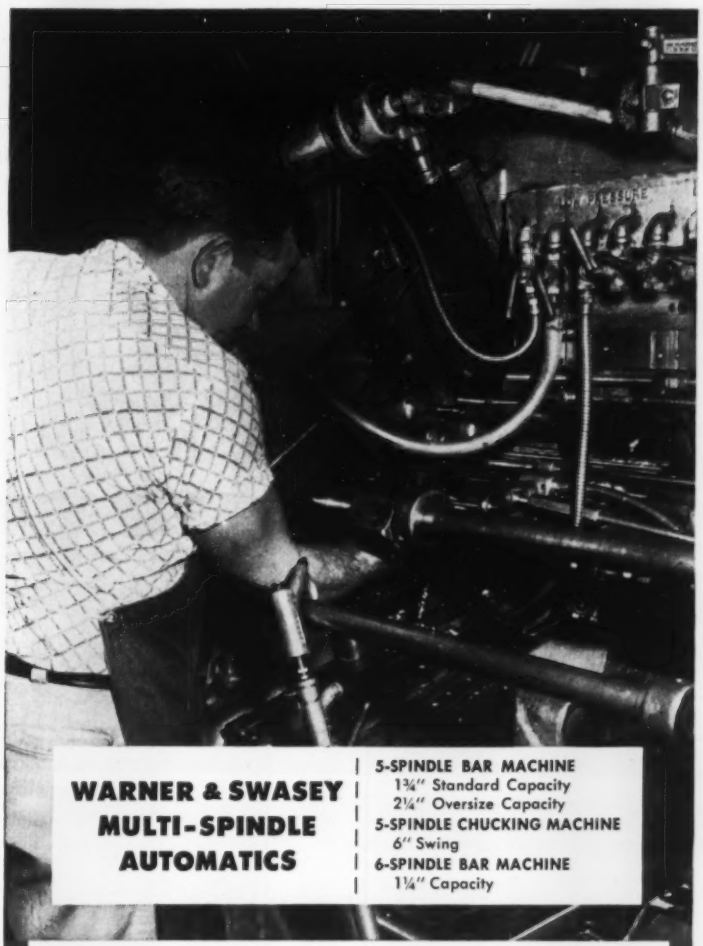
Mild steel sheets up to 12 gage are cut by the power shears in the No. 72 series. Gages at the front and rear of the machine can be positioned quickly.

The blades have four cutting edges. It's easy to turn a blade



WARNER & SWASEY AUTOMATIC CUTS SMALL LOT COSTS...

solves inventory problem for Cleco Division, Reed Roller Bit Company



WARNER & SWASEY MULTI-SPINDLE AUTOMATICS

- 5-SPINDLE BAR MACHINE
  - 1¾" Standard Capacity
  - 2¼" Oversize Capacity
- 5-SPINDLE CHUCKING MACHINE
  - 6" Swing
- 6-SPINDLE BAR MACHINE
  - 1¼" Capacity

Cleco Division, Houston, Texas, manufactures a wide variety of air tools. About 6000 different component parts must be machined each year—and, in order to keep reasonable inventory, in relatively small lots ranging from 100 to 1000 pieces.

While production on small hand-operated turret lathes kept inventory in line, it resulted in too high a cost per piece. On the other hand, economical production on conventional automatics required larger lot sizes and higher inventories.

In 1948, Cleco installed a Warner & Swasey 5-Spindle Automatic to solve both these problems. Its quick setup permits machining small lots at automatic rates—reducing cost per piece, and inventory at the same time.

This automatic has been operated on a two-shift basis—the equivalent of 16 years of one-shift production—with an exceptionally low record of downtime. Only $144 has been spent for repair parts. And despite this usage, cross slide form cuts to within .002" are easily held.

Foreman O. R. Palmer says: "We handle as much of our short run work as possible on the Warner & Swasey. Only when there's more such work scheduled than the machine can accommodate do we route the surplus to other automatics." Cleco operators like the automatic's quick-set quadrants which eliminate cam changing for feed strokes, its micrometer-dial cross slide adjustment, and general ease of operation.

If you'd like to reduce your machining costs on small and medium lot production—as well as long runs—call in our Field Representative. He'll be able to tell you whether your work can be done more profitably on a Warner & Swasey Multi-Spindle Automatic.

WARNER & SWASEY
Cleveland
PRECISION MACHINERY SINCE 1880

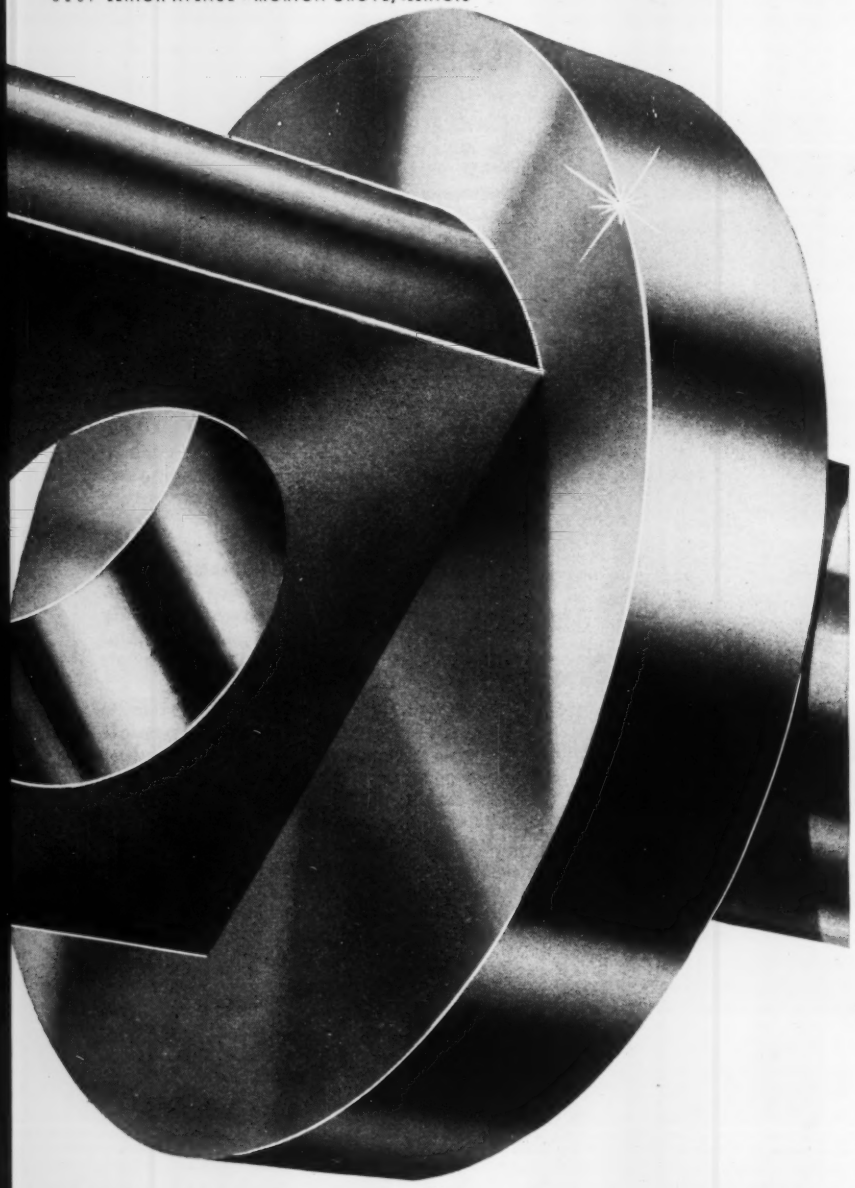
YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS...WITH A WARNER & SWASEY

150,000,000 standard fastenings in Brass, Bronze, Stainless, Aluminum, Copper, Nickel and Monel!

A call to your Harper Distributor and the fastening you want is on its way! Easy as that because he stocks thousands and thousands of standard fastenings for your convenience. Why shop? Why wait? Call your Harper Distributor for specialized attention and immediate delivery!

HARPER®

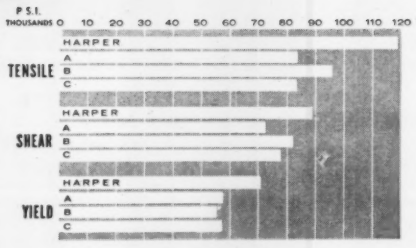
THE H. M. HARPER COMPANY
8207 LEHIGH AVENUE • MORTON GROVE, ILLINOIS



Laboratory tests prove greater strength of Harper stainless steel machine bolts

Independent laboratory tests* on stainless steel machine bolts produced by The H. M. Harper Company and three other leading producers of fastenings, prove Harper superiority in Yield, Tensile, and Shear Strength. Chart shows the actual results of these tests . . . irrefutable proof of Harper superiority! For complete details request Form No. 126.

*By R. W. Hunt Laboratories



NEW PRODUCTS and equipment

over or end for end to bring a new edge into use.

Blade guards have large clear plastic panels so the action in the cutting area can be seen at all times.

Width capacities of the shears: 36, 52 and 72 in. *Write*: Whitney Metal Tool Co., 724 Forbes St., Rockford, Ill. *Phone*: 2-5571

Electronic Scales

Load cells permit load bearing elements to be located at places remote from the indicating head. Installation is simplified because the compact load cells eliminate space-consuming lever assemblies.

Tare and unit weights are applied by the adjustment of control knobs. *Write*: Toledo Scale Co., Toledo 1, O. *Phone*: Kingwood 5441

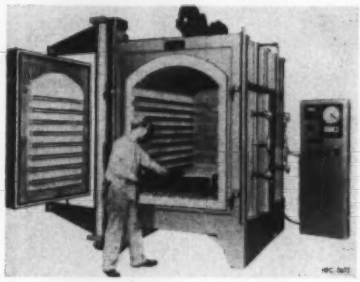
Forced Convection Furnace

The HFC series of true gradient furnaces are for aluminum brazing, tempering, drawing, normalizing, hardening and other operations with and without protective and special atmospheres.

Fans circulate the atmosphere in the firing chamber to insure close gradient control over the heat range of 250 to 1875°F. Low watt density type heating elements are designed for low gradients between the element surface and the furnace temperature.

Furnace sizes vary from 13 x 13 x 25 in. to 36 x 40 x 72 in.

NEW PRODUCTS and equipment



Write: L & L Mfg. Co., 136 Eighth St., Upland 100, Delaware County, Pa. *Phone*: Chester 2-5164

Welding Electrode

W613B is a heavily coated mild steel electrode for general purpose applications. It operates on alternating or direct current and meets specification AWS E6013.

Moderate arc force gives good penetration. Welds have uniformly feathered edges and good shape. The electrode is suitable for welding vertical fillets downward. *Write*: Welding Department, General Electric Co., Schenectady 5, N. Y. *Phone*: Franklin 4-2211

Power Screwdrivers

The Uni-Tork line of air and electric screwdrivers and nut setters operates in the torque range of 10 to 100 in.-lb.

Torque adjustment is set on the outside of the clutch attachment. The snap-action clutch disengages instantly when the preset torque

HARPER®

CORROSION-RESISTANT FASTENINGS

WHAT SPECIAL PART DO YOU NEED?

Let Harper Flo-Form save you time, money, metal!

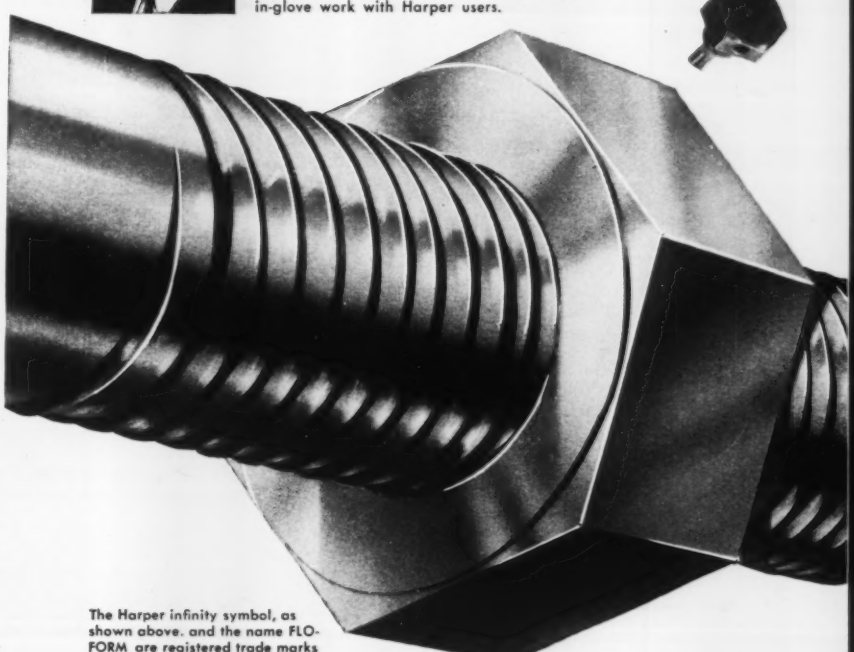
Only Harper, with its vast experience in corrosion-resistant fastenings, could develop Flo-Form—the copyrighted name for an exclusive process that turns out problem specials *better, faster,* and at *lower cost!* Call your nearby Harper Branch and outline your *"special problem"* to a Harper Application Engineer. See how quickly the team of Harper engineering, metallurgical, and tooling specialists speeds the right answer to you. See how Harper Flo-Form produces a cleaner, stronger, better special . . . faster . . . at lower cost! Draw upon our thirty-three years of know-how. Send your problem to The H. M. Harper Company, *today!*

THE H. M. HARPER COMPANY

8207 LEHIGH AVENUE • MORTON GROVE, ILLINOIS

Meet Harper Application Engineer, JAMES TURNBULL

Mr. Turnbull is typical of Harper Application Engineering Service. From the Harper Branch in New York City, he works with industry throughout Metropolitan New York. Important service by Mr. Turnbull includes daily solutions to special problems, through hand-in-glove work with Harper users.



The Harper infinity symbol, as shown above, and the name FLO-FORM are registered trade marks of The H. M. Harper Company.

KNOW Mississippi

We cordially invite you to read this important message from Mississippi's Governor J. P. Coleman.

Metal working plants can prosper in Mississippi . . .

There's a good climate for industrial growth down in Mississippi. Under our State's famed BAWI program we can finance your new metal working plant in a community of your own choosing, and grant you tax exemptions of five to ten years.

Every effort is made by the Governor, the Legislature and all responsible State officials to operate our State government on such a high plane of service, stability and economy as to leave no doubt in the minds of industrialists of the nation that Mississippi is a sound, safe and outstanding place in which to locate and operate —a place where they will receive fair and equitable treatment under sane and just laws.

Mississippi offers industrial enterprises the happy combination for a profitable plant operation — proximity to *markets,* a wealth of *materials,* and an adequate reservoir of *manpower.*

Would you like to know Mississippi's potential for your new plant? Please write me for the facts you need. We want you to know Mississippi.

J. P. Coleman
GOVERNOR OF MISSISSIPPI

Mississippi Agricultural & Industrial Board
STATE OFFICE BUILDING
JACKSON, MISSISSIPPI

THE BAWI STATE

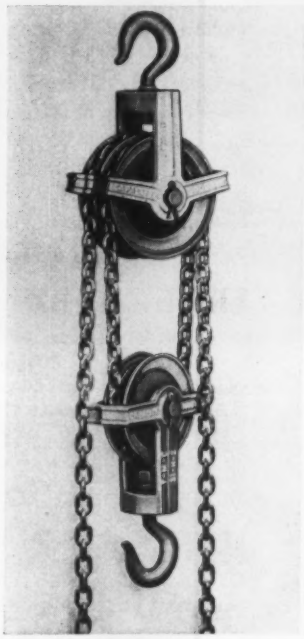
NEW PRODUCTS and equipment

is reached. There is no ratcheting, slipping or buzzing of the clutch jaws. *Write*: Thor Power Tool Co., Aurora, Ill. *Phone*: Aurora 2-7601

Hoist

The differential hoist 31H can lift up to 1000 lb.

High strength aluminum frames keep its weight down to 29 lb. It can be moved from one job to another easily or mounted on a trolley.

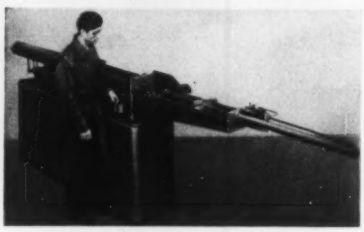


The chain is 26 ft long and provides a 7-ft lift. *Write*: Thern Machine Co., 3760 W. Fourth St., Winona, Minn. *Phone*: 9316

Broaching Fixture

The new Red Ring self-contained, air-powered broaching fixture provides automatic broach handling and part ejection.

A tandem air-hydraulic cylinder



You Get Better Results in HEAT TREATING!

Use the NIAGARA AERO HEAT EXCHANGER to control the temperature of your quench bath and you remove the heat at its rate of input, always quenching at the exact temperature that will give your product the best physical properties.

The Niagara Aero Heat Exchanger transfers the heat to atmospheric air by evaporative cooling. It extends your quenching capacity without using extra water. It pays for itself with water savings.

You can cool and hold accurately the temperature of all fluids, gases, air, water, oils, solutions, chemicals for processes and coolants for mechanical and electrical equipment. With the Niagara Aero Heat Exchanger you have closed system cooling, free from dirt and scale.

Write for Bulletin No. 120

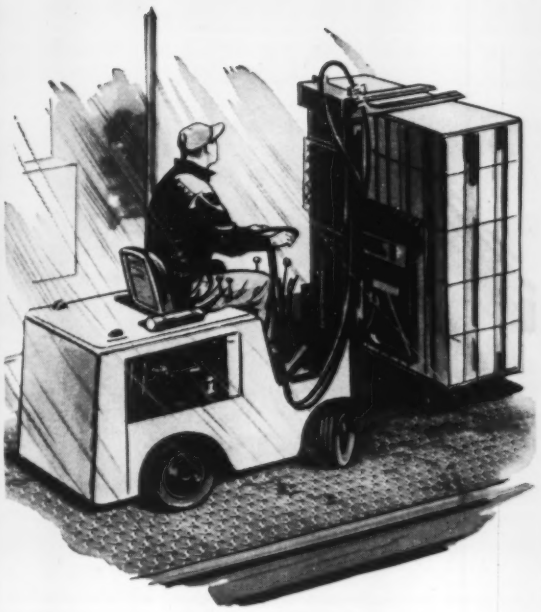
NIAGARA BLOWER COMPANY
Dept. S, 405 Lexington Ave.
NEW YORK 17, N. Y.

District Engineers in Principal Cities of U. S. and Canada

LOW COST DIFFERENCE BETWEEN

SKID

NO SKID



A.W. Super-Diamond rolled steel floor plate

- raised steel figures *diamond-shaped for maximum slip-skid resistance from all approach angles.*
- tough rolled steel floor plate for maximum industrial wear.
- non-directional pattern—no matching problems—minimum waste.
- easily fabricated with ordinary shop equipment for rapid installation.
- no maintenance problems—cleans, drains rapidly.
- use as independent flooring, structurally or as overlay.

For complete information write on company letterhead to Dept. SD-S12.

No other floor plate can match A.W. Super-Diamond's safety and durability at so low a cost.

Pattern actual size

Wherever oil, grease, or other substances raise special slipping accident hazards, we suggest a check on the special non-slip qualities of A.W. ALGRIP—the world's only abrasive rolled steel floor plate.

A.W. SUPER-DIAMOND
ROLLED STEEL FLOOR PLATE

ALAN WOOD STEEL COMPANY • CONSHOHOCKEN, PA.

Other Products: A.W. ALGRIP Abrasive Rolled Steel Floor Plate—Plates—Hot and Cold Rolled Sheet and Strip—(Alloy and Special Grades)

BEFORE RIVETING YOURSELF INTO A CORNER

. . . check with Milford Engineers!

Riveting raises *special* problems and requires *special* skills. You must have the right type and size rivet for each application, or the results can be costly . . . in production and in profits. When you're faced with a riveting problem, let Milford engineers lend a hand before designs are fixed!

To improve product appearance and strength
. . . to take full advantage of automatic assembly
. . . to cut delivery time and production costs
—get in touch with Milford first!

THE MILFORD RIVET

MILFORD RIVET & MACHINE CO.

MILFORD, CONNECTICUT • HATBORO, PENNSYLVANIA
ELYRIA, OHIO • AURORA, ILLINOIS • NORWALK, CALIF.

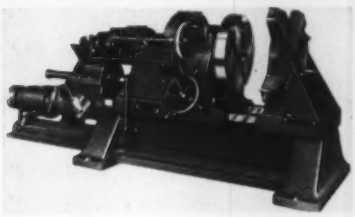
pulls the broach through the part, and a second air cylinder operates a broach retriever mechanism. A third air cylinder operates a part ejector. After a part is loaded on a locating platform, the broaching cycle is automatic.

The fixture has a 25-in. stroke. Maximum pulling force is 1450 lb and top broach speed is 70 fpm. *Write*: National Broach & Machine Co., 5600 St. Jean Ave., Detroit 13, Mich. *Phone*: Walnut 1-8980.

Facing Machine

This pipe and flange facing machine handles diameters from 2 to 24 in. It is designed for manual or electric-hydraulic cycled operation.

Substituting various types of fixtures and rotary tables for the steady rest, the machine will face flange-type valves and fittings with diameters from 2 to 36 in.

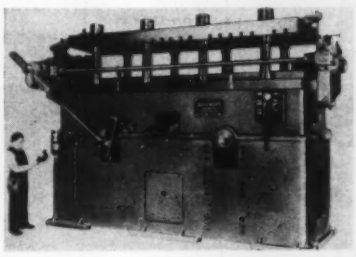


Multiple heads can be provided for simultaneous operations. Carbide tools can be used. *Write*: Forney's Inc., P. O. Box 310, New Castle, Pa. *Phone*: Oliver 2-6611

Automatic Press

This 450-ton double crank is for the production of dual headlight bowls for 1958 autos. It will take a die 36 x 170 in.

Even pressure at all die stations is insured by the use of eight guided draw rods and eight V-way

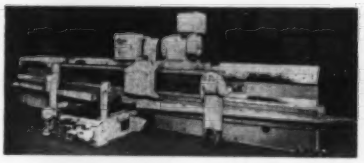


guides built into the base of the machine.

Both cranks are synchronized with balanced thrust loads. Tipping under load is minimized; the top platen is held parallel to the bed within 0.002 in. *Write*: Brandes Press Co., 6408 Euclid Ave., Cleveland, O. *Phone*: Endicott 1-4343

Broaching Machines

This line of horizontal surface broachers has speeds up to 300 fpm. The machines come in 180 and 240 in. stroke models.



Width of the ram face is 18 or 24 in. Capacity is 15 or 25 tons. Box-type and V-type ways are used. Most machines are equipped with phenolic-lined ways.

Trunnion or horizontal shuttle tables are available. For two-pass broaching, a vertical shuttle slide is used for positioning the fixture at the end of each stroke. *Write*: Colonial Broach & Machine Co., P.O. Box 37, Harper Station, Detroit 13, Mich. *Phone*: Jefferson 6-2550

Coolant

Tooleze 1234 is a water soluble compound that increases service life of tools used in heavy machining operations up to 35 per cent.

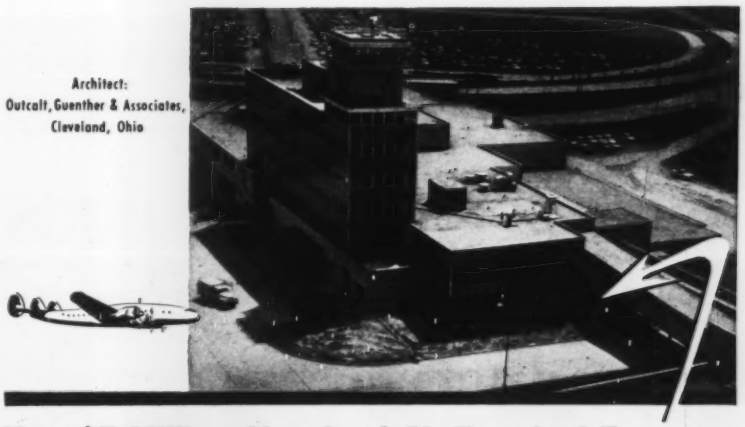
The coolant's wetting properties provide maximum cooling efficiency. It prevents welding of chips to the cutting tool and acts as a rust preventer. *Write*: Department 307, International Chemical Co., 2628 N. Mascher St., Philadelphia 33, Pa. *Phone*: Regent 9-2313

Tracer Lathe

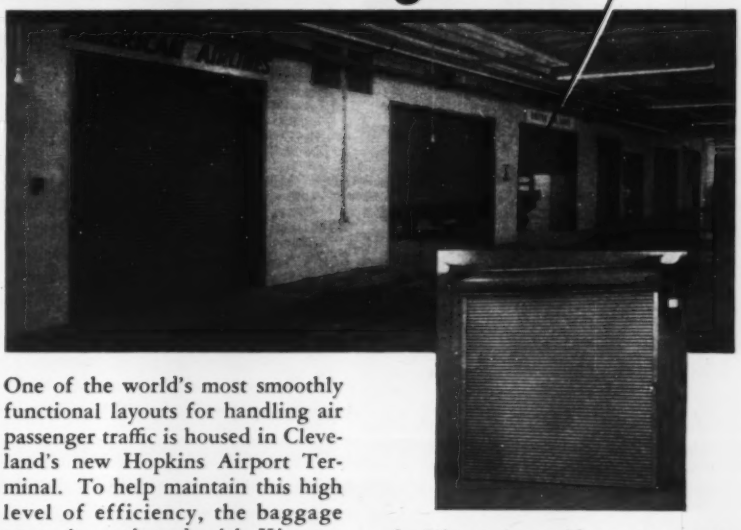
This 12-in. hydraulic duplicating lathe automatically reproduces multiple diameters, tapers, bevels, shoulders, radiuses, grooves and chamfers.

The variable speed drive provides spindle speeds from 43 to

Architect:
Outcalt, Guenther & Associates,
Cleveland, Ohio



New $5 Million Cleveland Air Terminal Features Kinnear Rolling Doors



One of the world's most smoothly functional layouts for handling air passenger traffic is housed in Cleveland's new Hopkins Airport Terminal. To help maintain this high level of efficiency, the baggage room is equipped with Kinnear Steel Rolling Doors.

The space-saving coiling upward action of Kinnear Doors has made them top choice through more than a half century of progress in building design, such as this new terminal represents.

Every foot of floor and wall space surrounding Kinnear Rolling Doors — *within an inch or two of the door curtain, either inside or outside the building* — is fully usable at all times.

When closed, the rugged curtain of interlocking steel slats *(originated by Kinnear)* provides extra protection against theft, intrusion, vandalism, storm, accidental damage, and fire. When raised, it clears the entire opening and *stays* out of reach of damage by wind or vehicles.

Highest resistance to rust and corrosion is assured by Kinnear's heavy-duty hot-process galvanizing, which applies a full 1.25 ounces of pure zinc per square foot of metal, by ASTM standards.

Kinnear Rolling Doors are built any size. Motor operation with push-button control also available. Write for the Kinnear catalog.

KINNEAR ROLLING DOORS
Saving Ways in Doorways

The KINNEAR Mfg. Co.
1780-1800 Fields Avenue, Columbus 16, Ohio
1742 Yosemite Ave., San Francisco 24, Calif.
Offices and Agents in
All Principal Cities

The only full-slewing superstructure crane designed exclusively for industrial materials handling

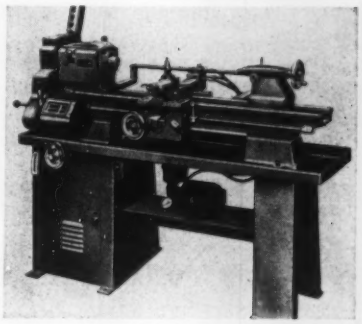
COLES lifts, lowers and carries with boom in any position throughout a 360° arc.

COLES
CRANES
JOLIET 7, ILLINOIS
WRITE FOR BOOKLET "101 Cost-Cutting Ways"

Photo courtesy Pacific Tube Company, Los Angeles

Now, available L.P.G.—diesel or gasoline-electric powered in capacities from 2 to 15 tons. Available on long term lease arrangement, too.

NEW PRODUCTS and equipment

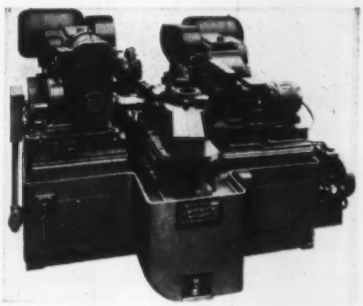


222 rpm and 250 to 1300 rpm without stopping the lathe or shifting belts.

The spindle has a 1⅜-in. bore and 1-in. collet capacity. *Write*: Clausing Division, Atlas Press Co., 21195 N. Pitcher St., Kalamazoo, Mich. *Phone*: Fireside 5-7157

Milling Machine

This duplex mill combines milling, drilling, rough boring and reaming in the processing of transmission housings. Production is 27 parts an hour.



All operations between load and unload are automatic. All clamping, movements and feeds are hydraulically controlled. *Write*: Machinery Mfg. Division, Motch & Merryweather Machinery Co., 888 E. 70th St., Cleveland 3, O. *Phone*: Utah 1-1515

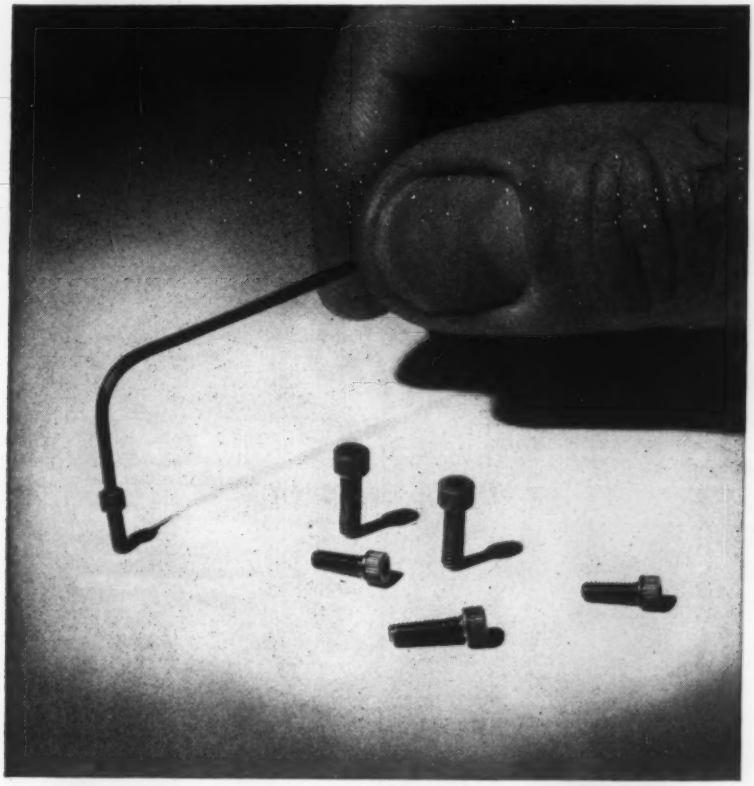
Two-Point Press

The S2-500 is a double-geared machine with automatic control for auxiliary feeding devices.

The slide is counterbalanced by air. A high-torque motor with a magnetic brake provides power adjustment.

Lights in both uprights illuminate the die space. The 500-ton

Miniature screws aid standardization of small devices



Standard UNBRAKO miniature socket head cap screws are available in sizes # 0, # 1, # 2 and # 3, in heat treated alloy steel or stainless steel, at your authorized industrial distributor's. Standard lengths range from ⅛ to ½ in.

Tiny close-tolerance Unbrako screws available in standard sizes

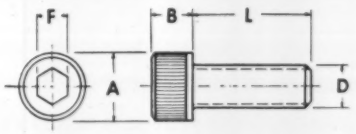
New economies in the design of space-saving miniature equipment are possible with these UNBRAKO miniature socket head cap screws. Manufactured to timepiece precision, available locally, they save the costly necessity of designing special screws to fasten tiny parts in compact units. They're ideal for use in typewriters, calculators and computers, servomechanisms, electric and electronic equipment—and in countless other small, intricate devices where maximum reduction in bulk and weight is required with no sacrifice in strength of individual components or assemblies.

Fingers grip the knurled heads on these tiny screws positively for easy handling and fast assembly. Uniform hex sockets assure maximum wrenching torque. Controlled fillets under the heads prevent shearing of the heads. Threads are fully formed for maximum strength and exact fit. Extremely accurate head diameters permit their use in countersunk holes, saving weight by reducing the length of the screw required and making flush designs possible.

These standard UNBRAKO miniature screws are available at your authorized industrial distributor's. See him today. Or write us for Bulletin 2055 and samples. Unbrako Socket Screw Division, STANDARD PRESSED STEEL Co., Jenkintown 33, Pa.

HEAT-TREATED ALLOY STEEL

Class 3 Fit Standard



	Diameter	Threads per Inch NC	Threads per Inch NF	Length	Recommended Installation Torque in Inch-Pounds NC	Recommended Installation Torque in Inch-Pounds NF	Weight per 1000 in Pounds
#0	A .104		80	⅛		2.0	.152
	B .060		80	3/16		2.0	.182
	D .060		80	¼		2.0	.210
	F .050		80	⅜		2.0	.265
#1	A .118		72	⅛		3.5	.27
	B .073		72	3/16		3.5	.32
	D .073		72	¼		3.5	.37
	F .050		72	⅜		3.5	.47
#2	A .140	56		3/16	6.0		.42
	B .086	56		¼	6.0		.50
	D .086	56		⅜	6.0		.58
	F 1/16	56		½	6.0		.70
#3	A .161	48		3/16	8.5		.59
	B .099	48		¼	8.5		.70
	D .099	48		⅜	8.5		.81
	F 5/64	48		½	8.5		1.03

Standard Screws are threaded to the head. Special materials, lengths, and threaded lengths are available. One "High-Titan" UNBRAKO hex key is included with each package of 100 screws.

UNBRAKO®

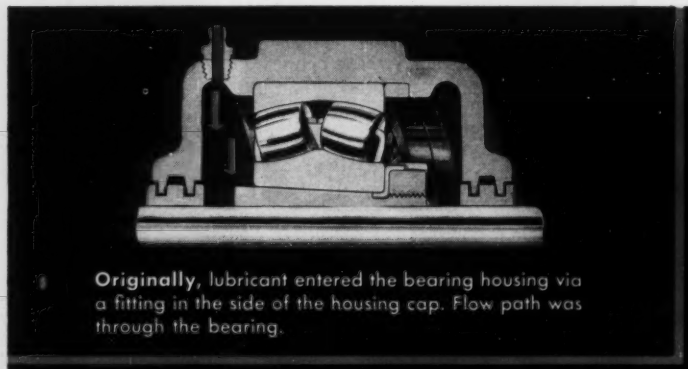
SOCKET SCREW DIVISION

STANDARD PRESSED STEEL CO.

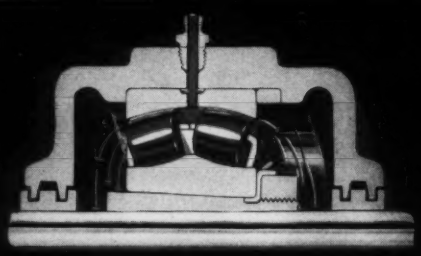
SPS

JENKINTOWN PENNSYLVANIA

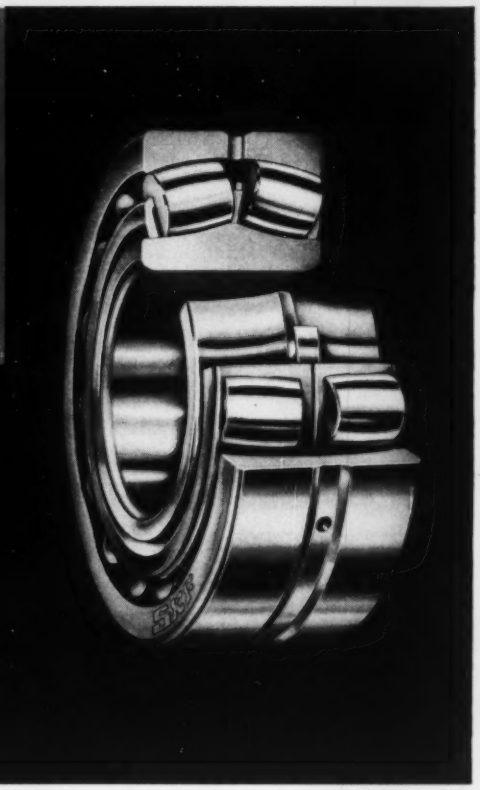
At No Extra Charge . . . A MAJOR IMPROVEMENT IN LUBRICATING SPHERICAL ROLLER BEARINGS



Originally, lubricant entered the bearing housing via a fitting in the side of the housing cap. Flow path was through the bearing.



NOW, the lubricant is introduced through a fitting in the center of the housing cap and moves along a groove that is machined around the circumference of the outer ring. Equally spaced holes drilled in the ring permit the lubricant to enter the center of the bearing.



Nobody but SKF Offers This to You on Spherical Roller Bearings

Once again **SKF** offers another important innovation in spherical roller bearing design. Available in spherical roller bearings 140 mm (5.5118") O.D. and larger, this feature represents a still further improvement to the proven **SKF** Type "C" Spherical Roller Bearing.

The new design allows the lubricant to enter at the *center* of the bearing and move outwardly – completely covering all working surfaces. Old lubricant is flushed away from the bearing and, with it, any abrasive dust, dirt, moisture, or other impurities.

You can use this improved bearing in your existing housings simply by moving the lubrication fitting to the center.

Here again is an example of how **SKF** helps you to obtain longer bearing life, at no added cost. Send for Bulletin No. 443 for complete details. 7781

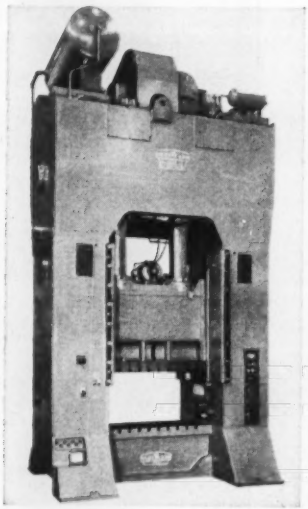
SKF®

EVERY TYPE—EVERY USE

Ball Bearings
Cylindrical Roller Bearings
Spherical Roller Bearings
Tapered Roller Bearings ("Tyson")

* Reg. U.S. Pat. Off. Tyson Bearing Corporation

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.

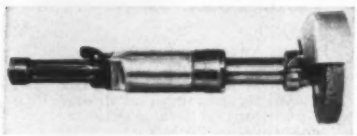


capacity machine has a recirculating oil system.

The press operates at 30 rpm. Bed and slide area is 36 x 60 in. Slide stroke is 12 in. *Write*: Cleveland Punch & Shear Works Co., 3917 St. Clair Ave., Cleveland 14, O. *Phone*: Henderson 1-1911

Air Grinders

The 4G series includes 12 models which cover four speeds and three throttle types.



Models with speeds of 4500, 6000, 9000 and 12,000 rpm are available. Throttles are the butterfly, grip and lever types. *Write*: Thor Power Tool Co., Aurora, Ill. *Phone*: Aurora 2-7601

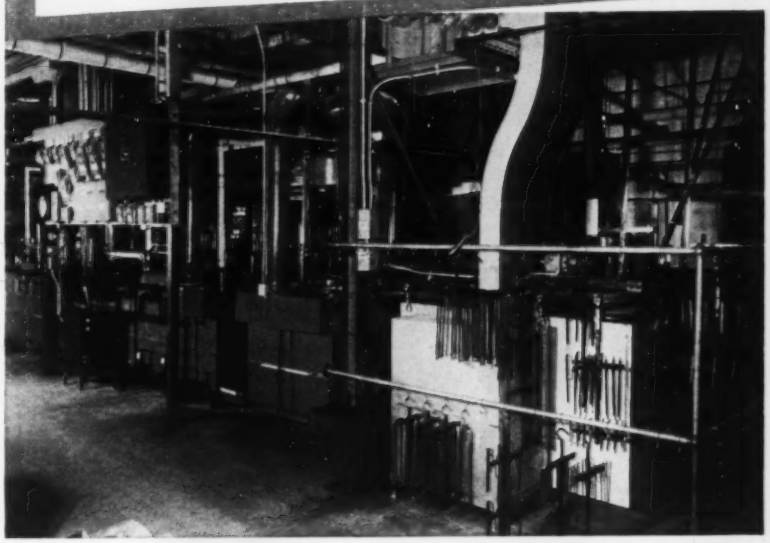
Conveyor Belt

Main/Rusco SC-18 is for general purpose conveying over pulleys or end rolls as small as 3½-in. in diameter. It combines the flexibility of solid woven belting with the strength and low elongation characteristics of stitched canvas.

The belt can be used on either side. It is sewn on ¼-in. centers and inner stitched on ½-in. centers.

The belt is available in a variety

A BRIGHT FUTURE IN MUSIC STANDS WITH UDYLITE HI-C BRIGHT NICKEL



Krauth and Benninghofen, of Hamilton, Ohio, has been making music stands for almost a hundred years. Now a third generation continues the operations making about 99 percent of all the music stands sold in the United States.

Last year Udylite Bright Nickel 514H, the high chloride, high speed process, with a bright chrome overlay replaced the single step gray nickel which had long been the standard music stand finish. The sales appeal of the bright nickel bright chrome finish forced higher production to meet the 20 per cent sales increase.

The operation of a Udylite high production Full Automatic Plating Machine enables these people to apply the new double process finish with precision and to get this better appearance and better corrosion resistance *at lower unit cost.*

Update *your* finish, *your* production and *your* costs with all of the advantages of Udylite Processes and Equipment.

THE Udylite CORPORATION DETROIT 11, MICHIGAN

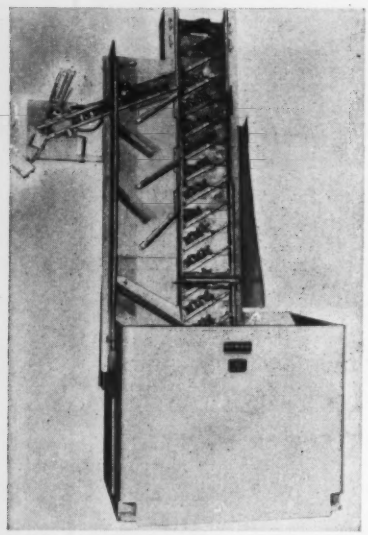
WORLD'S LARGEST PLATING SUPPLIER

of widths in three or four plies. *Write*: Main Belting Co. Division, Russell Mfg. Co., 220 E. Main St., Middletown, Conn. *Phone*: Diamond 6-7866

Feeder Unit

Model 2500 has been modified to feed parts to a Landis centerless grinder.

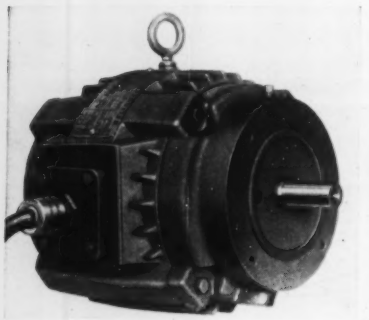
Parts are placed in the 9 cu ft capacity hopper. From there an



elevating conveyor takes them to the delivery chute which orients them and delivers them to the grinder. *Write*: Feedall Inc., P.O. Box 47, Willoughby, O. *Phone*: Willoughby 2-8100

AC Motors

This line of air-over motors produces varying horsepower according to the application of varying air velocities. This is done by the cooling effect of the air flow over the motor frame created by the fan or blower it powers.



Power output can be increased without exceeding the rated temperature rise of the motor. Motor sizes: ½ to 30 hp in the new NEMA frame sizes. *Write*: Reliance Electric & Engineering Co., 1088 Ivanhoe Rd., Cleveland 10, O. *Phone*: Glenville 1-3530

Bearing Assembly

Radial load capacity of 285,000 lb at 41 rpm is provided by the Three-in-One bearing for four-high mills.

The bearing assembly consists of single-acting thrust bearing and rollneck radial bearing. Three sets of 24 rollers (⅞-in. diam x 2⅜-in. long) are housed in separate machined bronze retainers and enclosed by 9½-in. wide inner and outer races.

Proper lubrication is insured by oil holes in the outer race, between retainers. *Write*: Rollway Bearing Co., 541 Seymour St., Syracuse, N. Y. *Phone*: 75-2121

Soldering Iron

Prest-O-Lite 406 is a medium soldering iron which handles all but the heaviest jobs in sheet metal, electrical, plumbing and maintenance shops.

The air-acetylene unit heats up to working temperature in less than 2 minutes.

Pointed and chisel-edge soldering heads are interchangeable. *Write*: Linde Air Products Co., a division of Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y. *Phone*: Murray Hill 6-5100

Balancing Hoist

Loads weighing up to 1½-tons can be picked up by this hoist. A crank control makes it possible to tilt loads at any convenient angle for positioning.

Uses: Setup in machine shops and assembly lines, positioning in welding shops, core setting in foundries and in lifting and replac-

(Advertisement)

BUILD A GAGE INSTALLATION TO SUIT YOUR NEEDS . . .
with these packaged, on-the-shelf P&W Air-O-Limit Light Signal Units. Can be used to signal operator or to provide feed-back impulse for fully automatic process control.
BASIC 2-LIMIT UNIT . . . indicates high and low tolerances. Suitable for sorting and other "yes-or-no" control applications.
3-LIMIT UNIT . . . especially suited for grinding and similar operations. Indicates or automatically controls such conditions as: "Fast Feed," "Slow Feed," and "Spark-Out."
4-LIMIT UNIT . . . similar to 3-Limit Unit, but provides greater control scope. Indicates or controls such conditions as: "Approach High Limit," "High Limit," "Approach Low Limit" and "Low Limit."

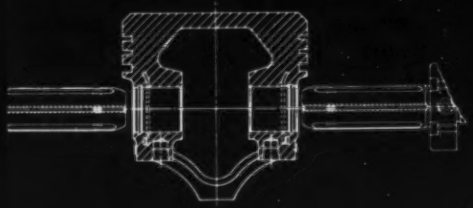


PHOTO COURTESY OF LASALLE TOOL, INC., DETROIT, MICHIGAN

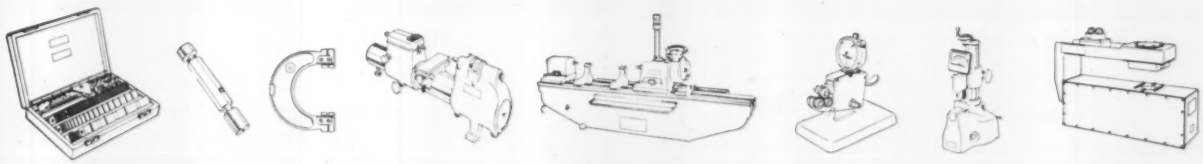
Help Yourself to Increased Output

WITH PRATT & WHITNEY STANDARD, ON-THE-SHELF GAGE CONTROL UNITS

INCREASED OUTPUT RATES, INSURED ACCURACY, REDUCED REJECT LOSSES . . . are the benefits you get with On-Machine Automatic or Automation Gaging! And now, these standard P&W Packaged Units . . . with appropriate tooling . . . can provide an installation tailored to your needs *without* the expense or delays required to engineer and construct special controls.

For example, these P&W Packaged Units made it easy to provide automatic on-machine gaging for this special, high-speed automotive piston machine produced by LaSalle Tool, Inc. Two P&W Air-O-Limit Carbide Gage Plugs are arranged to check the ID of both wrist pin bores on the pistons automatically. Lights on the P&W Control Units signal the operator if tolerances are exceeded. A second set of gage plugs similarly checks bores for the presence of snap ring grooves. If desired, control units can be arranged to shut down the machine automatically when an imperfect part is detected. Whatever *your* requirements, P&W can supply gaging equipment exactly right for the job.

For complete information, write to Pratt & Whitney Company, Inc., 13 Charter Oak Boulevard, West Hartford, Connecticut.

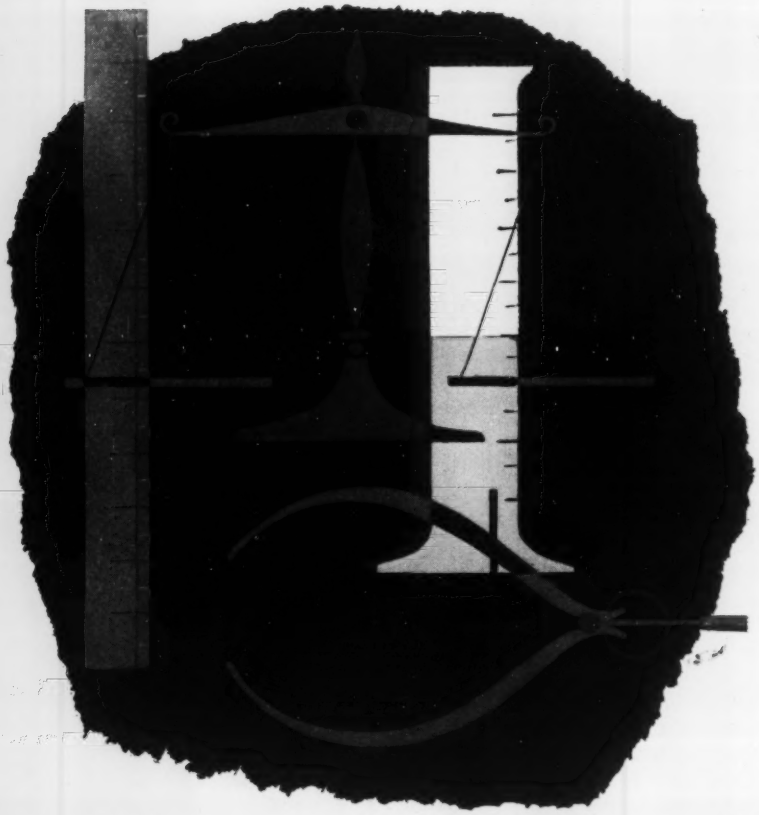


GE BLOCKS . . . CONVENTIONAL GAGES . . . SUPERMICROMETERS . . . STANDARD MEASURING MACHINES . . . COMPARATORS . . . AUTOMATION AND CONTINUOUS GAGES

PRATT & WHITNEY

FIRST CHOICE FOR ACCURACY

MACHINE TOOLS • GAGES • CUTTING TOOLS



how do you measure economy?

economy is not measured by price alone!

PROVED OVER THE YEARS

When you are concerned with metal abrasives there are many yardsticks that must be applied to truly measure economy.

How long will an abrasive last? How long before it breaks down into fines and becomes inefficient?

How destructive is the abrasive to machinery and equipment?

How efficiently does it perform and what is the time cycle for good performance?

To sum it all up — the economy of using any abrasive can be measured by the **cost per ton of metal cleaned!**

On every count, Malleabrasive has proved its superiority over the years in hundreds of plants.

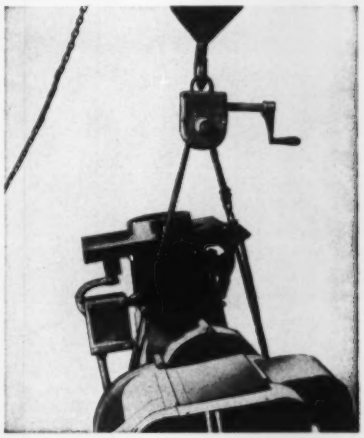
If you want to improve the economy of your blast cleaning operations — check Malleabrasive.

MALLEABRASIVE

THE GLOBE STEEL ABRASIVE CO., MANSFIELD, OHIO ®

Sold by Pangborn Corporation, and by leading distributors of foundry supplies from coast to coast

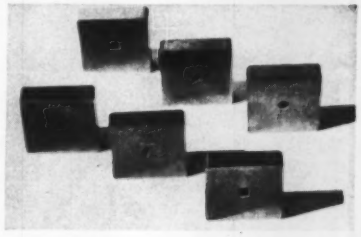
NEW PRODUCTS and equipment



ing engines in the automotive field. *Write*: Tilt-O-Lift Co., 9510 Belmont, Franklin Park, Ill. *Phone*: Gladstone 5-4092

Throwaway Blanks

A permanent system of identification is used with these cemented tungsten carbide blanks to prevent the mix-up of various carbide grades.

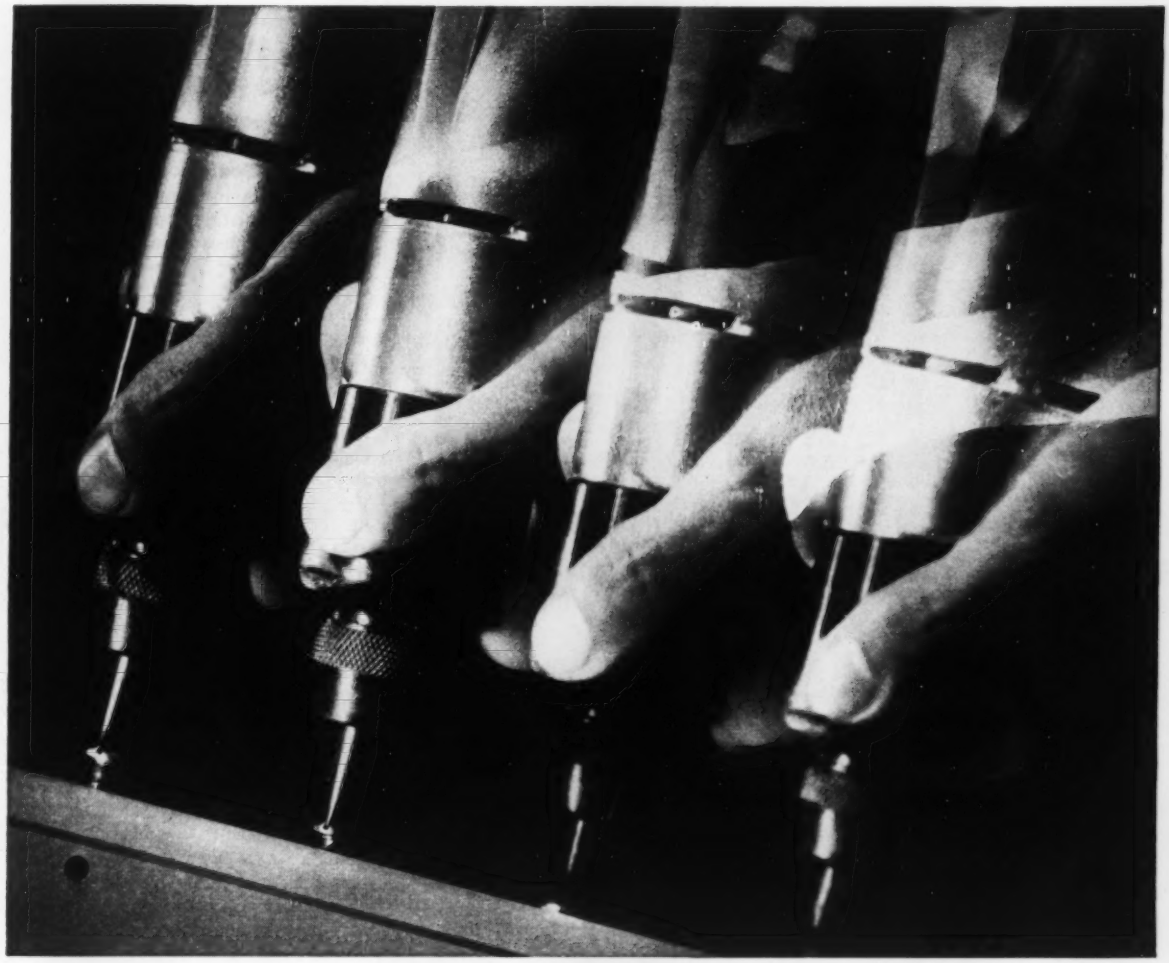


Geometric forms are pressed 1/64-in. into the face of the throwaway blanks. *Write*: Carmet Division, Allegheny Ludlum Steel Corp., Room 2036, Henry W. Oliver Bldg., Pittsburgh 22, Pa. *Phone*: Court 1-5300

Welding Electrode

EutecTrode 680 AC-DC deposits a weld with small grain size on high alloy steels. It produces joints with an ultimate tensile strength up to 120,000 psi. Deposits take a high polish.

The welds are wear, impact and corrosion resistant. *Write*: Technical Information Service, Eutectic Welding Alloys Corp., 40-40 172 St., Flushing 58, N. Y. *Phone*: Flushing 8-4000



Is assembly one of your largest production costs?

It probably is. Wherever fastenings must be made, this simple truth applies: The cost of the fastener is but a tiny fraction of the cost of using that fastener in production. The key to reduced assembly costs is the fastener that helps high-paid assembly hands turn out better work—*faster*. The P-K® Self-tapping Screw is that fastener!

Using screws that don't come up to P-K standards can raise total assembly costs as much as 25%. Screw failures not only result in assembly slow-downs . . . but in parts spoilage and hidden weaknesses as well. This is especially true in assembly by automation. Uniformity, such as P-K Self-tapping Screws offer, is automation's prime requirement for trouble-free assembly.

Why not talk to a Parker-Kalon Assembly Engineer —a man who is in daily contact with many different assembly set-ups. Perhaps he can show you how to reduce the number of fastenings in your product or how to solve a particularly difficult fastening problem. (That's his business.) Contact him through your local Parker-Kalon distributor.

PARKER-KALON DIVISION, General American Transportation Corporation
Manufacturers of Self-tapping Screws, Socket Screws, Screwnails, Masonry Nails, Wing Nuts and Thumb Screws

PARKER-KALON® fasteners

Sold Everywhere Through Leading Industrial Distributors
Factory: Clifton, New Jersey—Warehouses: Chicago, Illinois—Los Angeles, California

DURASPUN

20-FOOT FURNACE ROLLS

Centrifugally Cast

. . . of Duraloy HH Alloy, one of the most widely used high chrome, medium nickel alloys.

Two items concerning these furnace rolls may be of particular interest:

a—the size: 20 feet long—14" OD, ¾" wall thickness

b—*welding operations* by which reducing cones and shafts (both statically cast of the same alloy) were welded to the centrifugally cast rolls

These two items will serve to emphasize two phases of our service: (1) the large size centrifugally cast tubes we are able to produce and (2) our machining and finishing facilities, including welding.

Our new 16-page general Bulletin — 3354-G — gives complete details. Would you like a copy? When writing or calling would you mind telling us the general nature of your high alloy casting requirements? Better yet, if you have specific requirements on which we could help, let us have the details.

THE DURALOY COMPANY

OFFICE AND PLANT: Scottdale, Pa.

EASTERN OFFICE: 12 East 41st Street, New York 17, N. Y.

DETROIT OFFICE: 23906 Woodward Avenue, Pleasant Ridge, Mich.

CHICAGO OFFICE: 332 South Michigan Avenue

NEW literature

Write directly to the company for a copy

Stainless Honeycombs

A bibliography lists titles and references to articles published since 1950 on stainless steel honeycombs. Technical Editor, American Silver Co., 36-07 Prince St., Flushing 54, N. Y.

Power Squaring Shears

A line of underdrive shears with capacities from 16 gage to 1 in. in mild steel is described in catalog 69G, 74 pages. Niagara Machine & Tool Works, 683 Northland Ave., Buffalo 11, N. Y.

Cold Forging

A process for cold forging superalloys, steel and aluminum into virtually any shape is described in a 4-page bulletin. Impact Products Inc., Box 7, Orangeville, O.

Cutoff Machines

Bulletin DH-460-B, 4 pages, describes abrasive machines for wet and dry cutting. Campbell Machine Division, American Chain & Cable Co. Inc., 929 Connecticut Ave., Bridgeport 2, Conn.

Tube Fittings

Bulletin 4360, 12 pages, shows straight thread plugs and adapters, O-rings for straight thread fittings, and steel and brass pipe fittings. Tube & Hose Fittings Division, Parker Appliance Co., 17325 Euclid Ave., Cleveland 12, O.

Stainless Steels

Physical properties, heat treatment, strength at elevated temperatures, fatigue strength and resistance to oxidation of types 308, 309 and 310 stainless are described in an 8-page bulletin. Advertising Department, Allegheny Ludlum Steel Corp., 2020 Oliver Bldg., Pittsburgh 22, Pa.

Gear Checker

Bulletin 481-A, 2 pages, describes the operation and capabilities of an automatic-cycle gear checker that measures and records parallelism, tooth taper and tooth spacing. Michigan Tool Co., 7171 E. McNichols Rd., Detroit 12, Mich.

Digital Computer

A 6-page bulletin describes a general purpose digital computer and its digital differential analyzer accessory which increases the versatility

℞ — *Fast Cure for BIG Complications . . .*

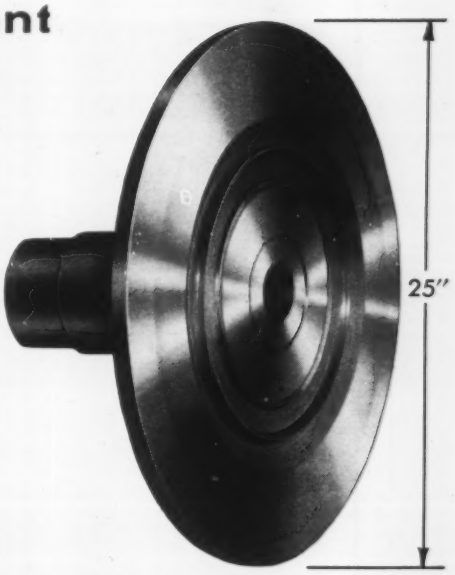
A SPECIAL P&J Treatment with STANDARD Tools

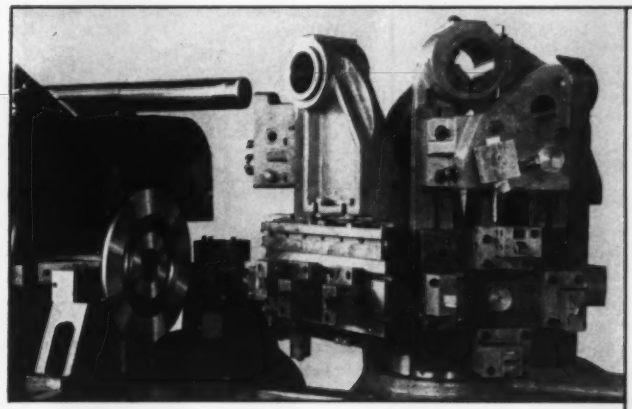
THE PART: A BIG (25-inch diameter) heavy, cast steel Pressure Plate Hub.

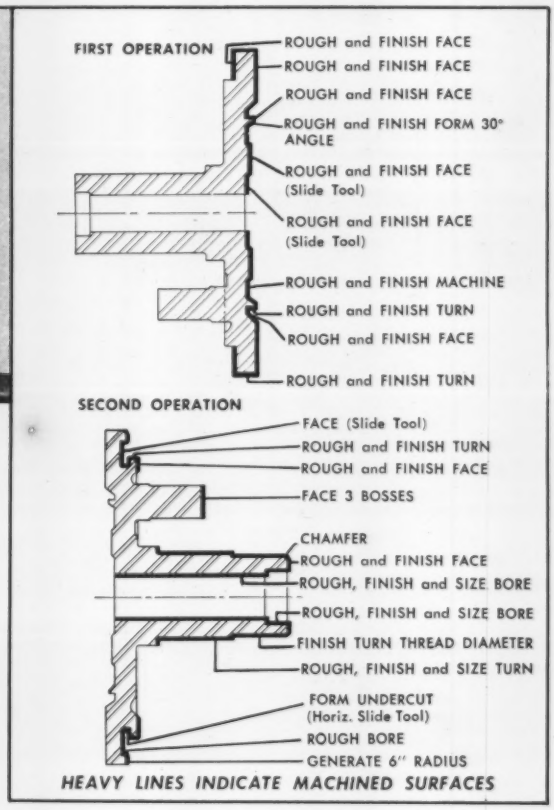
THE COMPLICATIONS: 42 separate roughing and finishing cuts involving very heavy stock removal. High accuracy and close concentricity required on *all* machined surfaces, and a fine micro-finish specified for two hub diameters!

THE TREATMENT: Take a big, powerful Potter & Johnston 10-U Automatic; team it with P&J-Engineered Tooling using *STANDARD,* basic tools.

THE RESULTS: Part finished quickly and economically according to specs in just over 47 minutes machining time . . . and tool costs kept to an absolute minimum.






FIRST OPERATION
ROUGH and FINISH FACE
ROUGH and FINISH FACE
ROUGH and FINISH FACE
ROUGH and FINISH FORM 30° ANGLE
ROUGH and FINISH FACE (Slide Tool)
ROUGH and FINISH FACE (Slide Tool)
ROUGH and FINISH MACHINE
ROUGH and FINISH TURN
ROUGH and FINISH FACE
ROUGH and FINISH TURN
SECOND OPERATION
FACE (Slide Tool)
ROUGH and FINISH TURN
ROUGH and FINISH FACE
FACE 3 BOSSES
CHAMFER
ROUGH and FINISH FACE
ROUGH, FINISH and SIZE BORE
ROUGH, FINISH and SIZE BORE
FINISH TURN THREAD DIAMETER
ROUGH, FINISH and SIZE TURN
FORM UNDERCUT (Horiz. Slide Tool)
ROUGH BORE
GENERATE 6″ RADIUS
HEAVY LINES INDICATE MACHINED SURFACES

Performance like this is no exception; it's just one more example of the way a Potter & Johnston Automatic Chucking Turret Lathe can take problem parts in stride. If you're looking for new standards of speed and economy, make it a standard practice to put your complicated jobs on a P&J Automatic with P&J Tooling. In addition to the big 10-U used to machine this massive pressure plate hub, P&J produces a complete line of Automatics for every work size requirement, so send for complete information today.

Write today for complete information . . . or phone the Pratt & Whitney Branch Office near you, and ask a Direct-Factory Representative to call and discuss your requirements. **Potter & Johnston Company, Pawtucket, Rhode Island (Subsidiary of Pratt & Whitney Company, Incorporated).**

POTTER & JOHNSTON

Precision Production Tooling for more than Fifty Years

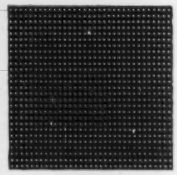
AUTOMATIC TURRET LATHES • NEWARK GEAR CUTTERS

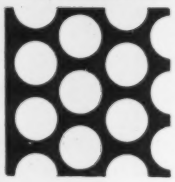
H&K PERFORATED MATERIALS

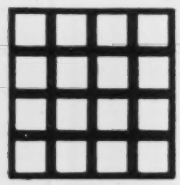
Utility • Beauty • Economy
FOR TOMORROW'S PRODUCTS

A *MEDIUM* OF LIMITLESS APPLICATIONS

Designers are discovering an ever-increasing range of applications for perforated materials. For functional or decorative purposes, or where a combination of both is essential, H & K perforated materials are used in more products, in more accessories, in more places than ever before.

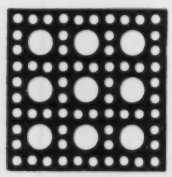






REDUCES TOOLING COSTS

Design, pattern and open area for almost every application may be selected from our thousands of perforating dies—at no charge for tooling. (Tools for special designs can be built to order.)

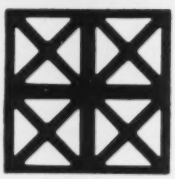


MATERIALS PERFORATED

Harrington & King can perforate practically any metallic or non-metallic material that can be obtained in coils, sheets or plates . . . from foil-thin to 1" thick.

H & K engineers will be pleased to work with you on your requirements.

See our catalog in Sweet's Product Design File.



FIND NEAREST H&K AGENT IN THE 'Yellow Pages'

Listed Under "Perforated Metals"

Fill in and mail coupon to the nearest H & K office.

THE Harrington & King PERFORATING CO. INC.

Chicago Office and Warehouse	New York Office and Warehouse
5627 Fillmore Street	118 Liberty Street
Chicago 44, Ill.	New York, N.Y.

Please send me—

☐ GENERAL CATALOG NO. 62

☐ STOCK LIST of Perforated Steel Sheets

NAME_____

TITLE_____

COMPANY_____

STREET_____

CITY_____ ZONE_____ STATE_____

NEW LITERATURE

and range of operations. Bendix Computer Division, Bendix Aviation Corp., 5630 Arbor Vitae St., Los Angeles 45, Calif.

Metal Sawing

A 36-page handbook covers the selection and use of hand and power hack saw blades and band saw blades. W. O. Barnes Co. Inc., 1297 Terminal Ave., Detroit 14, Mich.

Steel Springs

Hot and cold wound springs are described in a 16-page bulletin. Alco Products Inc., P.O. Box 1065, Schenectady 5, N. Y.

Steel Data Book

Machining and fabrication, weights and dimensions, elements and safe loads are covered in a 256-page book. Joseph T. Ryerson & Son Inc., Box 8000-A, Chicago 80, Ill.

Steel Tube Fittings

A 48-page catalog presents engineering data on hydraulic flareless tube fittings and 37-degree flare fittings. Customer Service Department, Weatherhead Co., 128 W. Washington Blvd., Ft. Wayne, Ind.

Press Welder

Bulletin 3-513, 8 pages, describes a machine with a maximum welding force of 7500 to 12,000 lb. Taylor-Winfield Corp., Warren, O.

Liquid and Gas Control

Bulletin 005, 36 pages, describes equipment for measurement and control of liquids and gases. Simplex Valve & Meter Co., 7 E. Orange St., Lancaster, Pa.

Industrial Periscopes

Hazardous processes or inaccessible places can be viewed with the periscopes described in this 4-page bulletin. Lenox Instrument Co., 2010 Chancellor St., Philadelphia 3, Pa.

Sheet Lifters

Bulletin 202, 2 pages, describes lifters with low headroom which can be operated by one man. Downs Crane & Hoist Co., 540 W. Vernon Ave., Los Angeles 37, Calif.

Fluxes

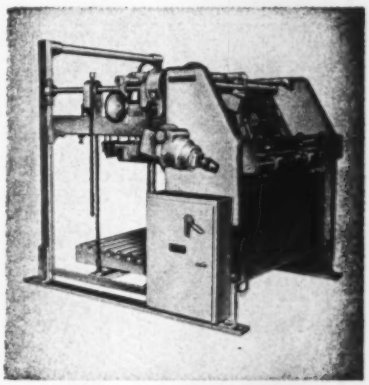
Mild acid flux, nonactivated and activated resin flux for electronic, electrical, dip and printed circuit soldering are described in a 1-page bulletin. Accurate Specialties Co. Inc., 9-01 43rd Ave., Long Island City, N. Y.

DEXTER AUTOMATIC METAL SHEET FEEDER

Metal sheets, automatically separated, picked up and advanced one at a time to feeding—in point of machine to which it is attached at speeds up to 150 sheets per minute.

Should two sheets adhere, they are automatically transferred to a reject tray. Rubber suction mouthpieces and drop rollers prevent scratching.

Standard Feeder handles metal sheets from 14" x 18" up to 36" x 44" between 24 and 38 gauge stock. Feeders for larger size and heavier gauge metal sheets also available.



Continuous reloading avoids machine stoppage. New loads are placed in feeding position, while machine is operating, thus maintaining continuous automation cycle.

Dexter Feeder may be attached to Metal Litho Presses, Coating Machines, Sorting Machines, Shears, Slitters, Sprayers, Punch Presses, Stove Pipe Machines, Buffers and numerous other metal working machines.

Custom built sheet feeders for handling paper, cardboard, corrugated and other types of sheets are available to meet specific requirements. Inquiries invited.

DEXTER

EST. 1880

DEXTER FOLDER COMPANY

General Sales Offices

330 WEST 42ND STREET
NEW YORK 36, N. Y.

NEW LITERATURE

Tube Fittings

A 4-page bulletin covers fittings for steel and copper tubing. Lenz Co., 3301 Klepinger Rd., Box 1044, Dayton 1, O.

Electron Microscope

This 12-page bulletin gives data on construction and operation of electron microscopes. Instruments Division, North American Philips Co. Inc., 750 S. Fulton Ave., Mt. Vernon, N. Y.

Jib Cranes

A line of self-supporting jib cranes with capacities of 6 to 15 tons is covered in a 4-page bulletin. R. G. LeTourneau Inc., 2399 S. MacArthur, Longview, Tex.

Thermal Conductivity Analyzer

An electronic recorder and analyzer for determining the amount of CO_2, H_2, He, CH_4 and other gases is described in bulletin 56-1008-59, 12 pages. Hays Corp., Michigan City, Ind.

Heat Exchangers

An 8-page bulletin describes a line of heat exchangers for acid, salt and alkaline solutions from 35 to 200°F. Nukem Products Corp., 121 Colgate Ave., Buffalo 20, N. Y.

Welding Cables

A 6-page bulletin describes copper and aluminum cables for arc welding and power supply uses. General Cable Corp., 420 Lexington Ave., New York 17, N. Y.

Steel Fatigue

A bulletin discusses the fatigue properties of cast and comparable wrought steels. Steel Founders' Society of America, 606 Terminal Tower, Cleveland 13, O.

Resinoid Wheels

Reinforced wheels, straight, raised hub disc and cutoff, are described in an 18-page bulletin. Bay State Abrasive Products Co., Westboro, Mass.

Diecasting Machines

Bulletin 5700, 12 pages, describes a line of cold chamber machines with 200 to 800-ton capacities. Hydraulic Press Mfg. Co., a division of Koehring Co., Mt. Gilead, O.

Double Coated Tapes

Advantages of tapes with adhesive on both sides in holding, splicing and bonding are described in a 4-page bulletin. Polyvinyl tapes that cover and protect metal surfaces against

A Conco engineered Crane is **top management's** idea of value. Quality like this means minimum maintenance cost, slow depreciation, tailored-to-the-job engineering, reduced accident hazards. Conco engineered Cranes reflect the more than 37 years experience that lies behind them. Write for bulletin 5000A covering the complete line of Conco cranes, hoists and trolleys.
FROM ANY VIEWPOINT
A FINER CRANE
CRANES HOISTS
CONCO
CONCO ENGINEERING WORKS
Division of H. D. Conkey & Company 70-14th Ave., Mendota, Illinois
AFFILIATES: Conco Engineering Works—Domestic Heating Equipment • Conco Building Products Inc.,—Brick, Tile, Stone
JIB CRANES
ELECTRIC HOISTS
CHAIN HOISTS AND TROLLEYS
HAND GEARED CRANES
CRANE ASSEMBLIES

Specializing in compounding the finest cutting oils and lubricants for industry.

Our staff of highly trained engineers is prepared to help you solve the most stubborn lubrication problem in your plant.

Write, wire, or phone today.

EN-AB-CO PROMAX CUTTING OILS

NATIONAL REFINING CO., CLEVELAND 1, OHIO

ESTABLISHED 1882

One Sure Way to CUT COSTS!

use a C-F SHEET LIFTER

The A. B. Dick Company, Niles, Illinois, found that this C-F Lifter has substantially reduced man hours and crane time required to move stock in and out of storage.

Up to 10,000 lbs. of high grade sheets in varying widths may be picked up, carried and unloaded at shears or machines with speed and economy by the Lifter and its operator.

C-F Lifters are made in standard or semi-special models to handle from 2 to 60 tons. Bulletin SL-25 describes the advantages you can obtain from C-F Lifters. Write for it today.

CULLEN-FRIESTEDT CO.

1308 South Kilbourn Avenue • Chicago 23, Illinois

NEW LITERATURE

corrosion above and below ground are described in an 8-page bulletin. Dutch Brand Division, Johns-Manville, 7800 S. Woodlawn Ave., Chicago 19, Ill.

Dry Lubricant

Here's information on a dry film lubricant for drawing and forming titanium and its alloys, chromium and stainless steels at temperatures of 600 to 1400°F. Alpha Molykote Corp., 65 Harvard Ave., Stamford, Conn.

NEW BOOKS

ASTM Methods for Chemical Analysis of Metals, 1956 Edition, American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. 640 pages, $8.

The first complete revision since 1950, the new edition contains all ASTM methods for chemical analysis of ferrous and nonferrous metals and alloys, including spectrochemical procedures. The methods are intended for referee purposes in marketing and purchasing of metals and alloys according to specifications.

ASTM Standards, 1956 Supplement Part 1. Ferrous Metals, American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. 440 pages, $4.

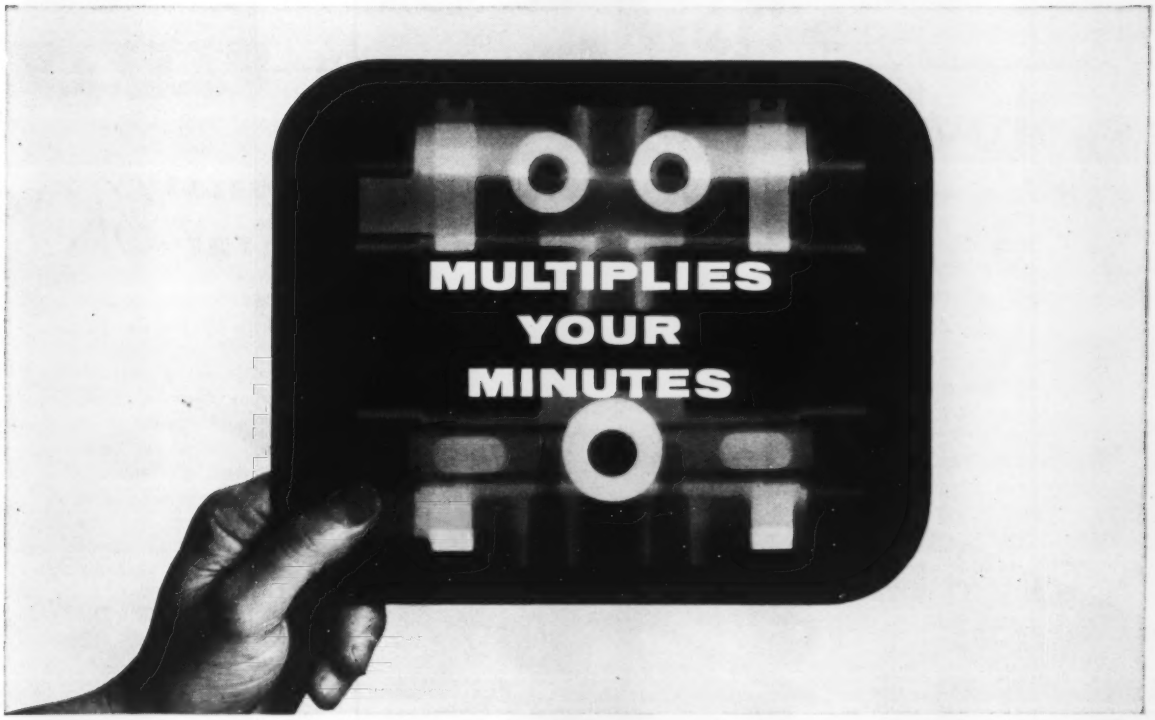
Included are 48 standards covering steel pipe, tubes, fittings, castings, bolting materials, plates, rivets, springs, chains and rails.

ASTM Standards, 1956 Supplement Part 2. Nonferrous Metals, American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. 360 pages, $4.

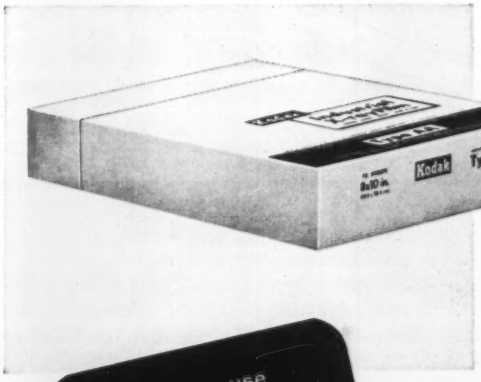
Sixty standards cover copper and copper base alloys, nickel and nickel base alloys, electrical resistance and related alloys, metal powders and products, diecast metals and alloys, aluminum and its alloys, magnesium and magnesium base alloys and metallic electrical conductors.

Defects and Failures of Metals, E. P. Polushkin, D. van Nostrand Co. Inc., 257 Fourth Ave., New York 10, N. Y. 399 pages, $12.50.

Origin, causes and the elimination of defects are discussed. Information is presented for those concerned with producing, fabricating, treating, testing and inspecting metals and metal products.



New Kodak Industrial X-ray Film, Type AA



When you're faced with the need for quantities of high-quality work, Kodak's new Industrial X-ray Film can be an outstanding find.

Because of its greatly increased speed, exposure times can be cut, and more production realized with existing x-ray equipment and gamma ray sources.

While this new film ranges up to more than twice as fast, it still has the fine sensitivity characteristics which made Kodak Type A the most widely used x-ray film in industry.

Kodak Industrial X-ray Film, Type AA, extends the service of present radiographic equipment, saves time, produces quality results. Have your x-ray dealer or Kodak Technical Representative show you how.

EASTMAN KODAK COMPANY
X-ray Division Rochester 4, N. Y.

Read what the new Kodak Industrial X-ray Film, Type AA, does for you:

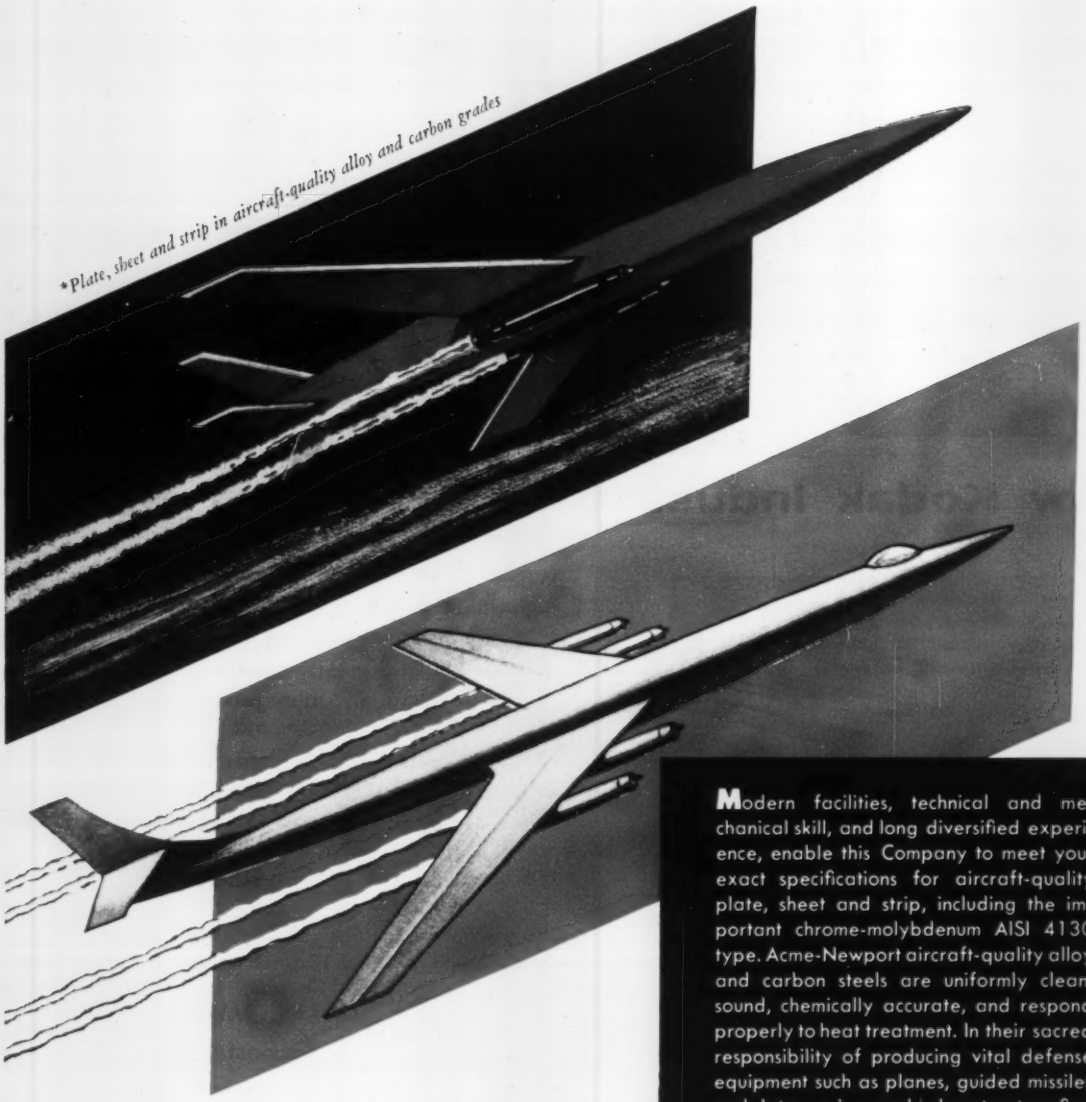
- Reduces exposure time—speeds up routine examinations.
- Provides increased radiographic sensitivity through higher densities with established exposure and processing technics.
- Gives greater subject contrast, more detail and easier readability when established exposure times are used with reduced kilovoltage.
- Shortens processing cycle with existing exposure technics.
- Reduces the possibility of pressure desensitization under the usual shop conditions of use.

Kodak
TRADE-MARK

Acme-Newport Steel

CLEAN, SOUND, ACCURATE STEELS* FOR THE SKY

*Plate, sheet and strip in aircraft-quality alloy and carbon grades



Modern facilities, technical and mechanical skill, and long diversified experience, enable this Company to meet your exact specifications for aircraft-quality plate, sheet and strip, including the important chrome-molybdenum AISI 4130 type. Acme-Newport aircraft-quality alloy and carbon steels are uniformly clean, sound, chemically accurate, and respond properly to heat treatment. In their sacred responsibility of producing vital defense equipment such as planes, guided missiles and Jatos, prime and subcontractors find this uncompromising quality more than adequate. Acme-Newport would like to discuss your requirements and their own qualifications as a dependable source.

Acme-Newport Steel COMPANY

NEWPORT, KENTUCKY

A SUBSIDIARY OF ACME STEEL COMPANY

Market Outlook

STEEL INGOT production in January just about equaled the all-time monthly record set last October. The record is 11,048,513 net tons. January shaped up to around 11 million tons. This is 97 per cent of capacity.

On an annual basis, this would be close to 132 million tons. No one has expected this year's output to be this large. Predictions have been for 120 million tons—this would be a record. So far, the record is 1955's 117 million tons. The industry could make 120 million tons of steel for ingots and castings by operating at 90 per cent of capacity. Because mills have increased capacities, they can turn out record tonnages while operating at less than capacity.

ENCOURAGING— Although demand for many forms of steel is lighter than it was, Republic Steel Corp. saw its January volume of incoming orders run ahead of shipments. In the Buffalo area, new orders for steel are keeping pace pretty well with shipments. The Buffalo district has been producing steel for ingots and castings at around 105 per cent of capacity.

AUTOS PICK UP— Much of the reduced demand for steel has been laid to the relatively slow pace in the automobile industry, the biggest consumer of steel. But a pickup took place in the auto industry in January. Passenger car output totaled approximately 632,000 units, compared with 611,190 in January of last year and 597,083 in December.

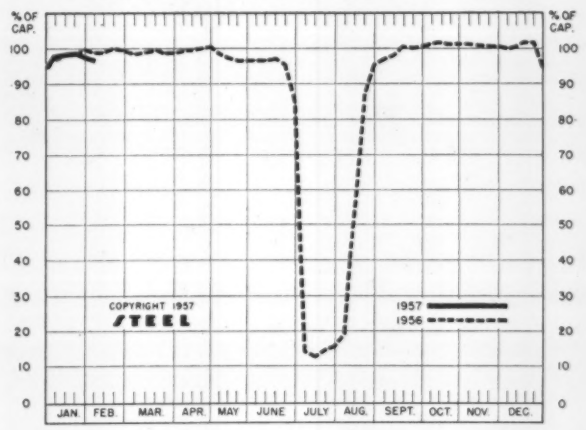
UPWARD— Not all forms of steel are readily available. Plates and structural shapes continue to be in strong demand. This demand, and the effort to satisfy it, will boost production of plates and shapes to more than 15 million tons in 1957, Clifford F. Hood, president, U.S. Steel Corp., Pittsburgh, told a Senate committee. Production of them in 1956 totaled around 12.8 million tons.

STRENGTH— A Chicago mill reports its capacity for plates and shapes could be sold two or three times over. Tin plate demand is strong, with the prospect it will remain this way throughout the year. This Chicago mill admits carbon bars are becoming increasingly available in all sizes but reveals its March-April rolling cycle is full. Merchant wire products shipments from the Chicago area were 10 to 15 per cent higher in January than in the corresponding month a year ago. An improved year in merchant products looks possible because of the somewhat stronger position of farmers.

OUTPUT THREATENED— Production of steel for ingots and castings eased off 1 point in the week ended Feb. 3 to 96.5 per cent of capacity. This high rate of output was threatened by a strike-reduced supply of oxygen. Oxygen is used to speed the production of steelmaking furnaces—also for scarfing and cutting. The strike was among employees at oxygen producing plants.

PRICE TRENDS— Mill prices of steel continue to edge upward through the revision of extras. Going up last week were price extras on bars. Warehouses—department stores of the steel industry—are putting their prices up, too, passing on increases levied on them by the mills.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

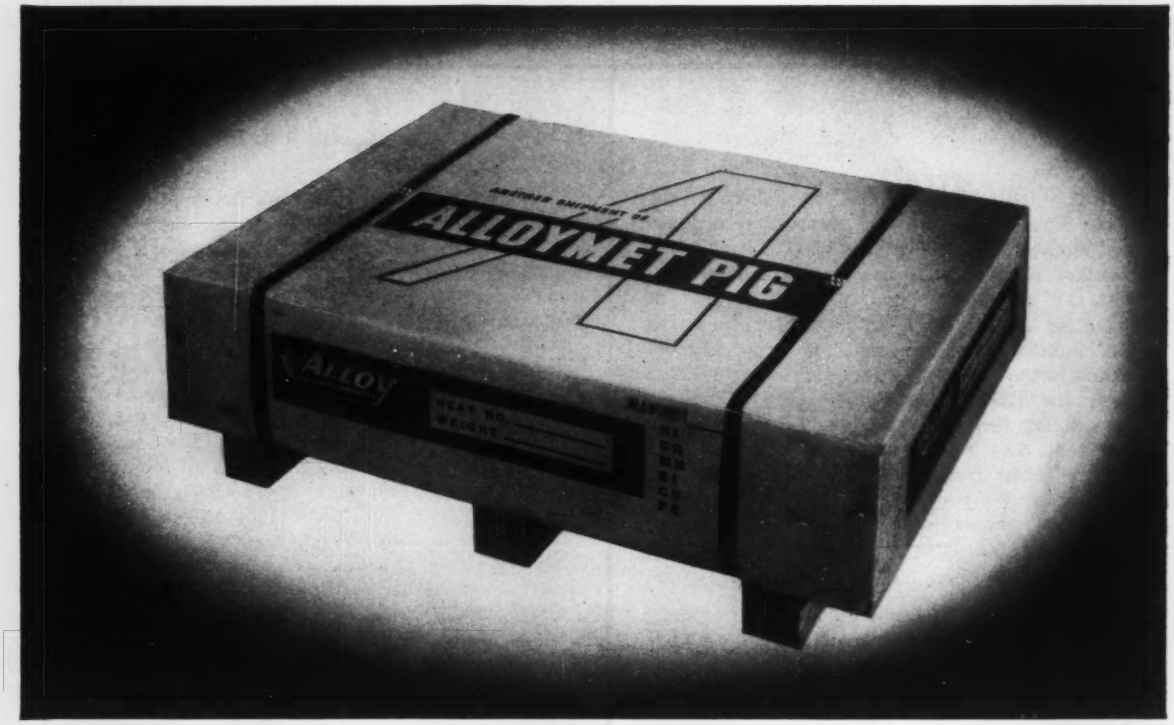
	Week Ended Feb. 3	Change	Same Week 1956	Same Week 1955
Pittsburgh	98.5	— 1.5*	101.5	82
Chicago	97.5	— 1*	101.5	88
Mid-Atlantic	98	— 1	102	84
Youngstown	100	0	98	88
Wheeling	102.5	+ 2.5	100.5	95.5
Cleveland	94.5	+ 0.5*	101	87
Buffalo	105	0	105	100
Birmingham	96.5	— 1.5	95.5	79
New England	70	— 5	89	79
Cincinnati	90	— 2.5	96.5	88
St. Louis	99	+ 1.5	106	89
Detroit	101.5	— 4	97	91.5
Western	103	— 2	107	86
National Rate	96.5	— 1	99	86

INGOT PRODUCTION‡

	Week Ended Feb. 3	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	154.7†	153.9	153.0	152.1
NET TONS (In thousands)	2,485	2,472	2,490	2,445

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,559,490 in 1957; 2,461,893 in 1956; 2,413,278 in 1955.

Metalworking Outlook—p. 53 Technical Outlook—p. 99



NEW "BOX LUNCH" of NICKEL ALLOY

speeds feeding of electric furnaces

26 nickel alloy pigs, each weighing about 50 pounds, travel inside this new palletized package. Weight and certified analysis are in plain view at all times. All fiberboard, it can go into the electric furnace "as is." It weighs only ¼ as much as a wooden pallet. Saves on transportation costs. Discourages pilferage. Speeds handling.

Users are already enthusiastic about this new nickel alloy package. Like the quality product it contains, it serves as a further example of the exacting care Alloy Metal Products, Inc., exercises in every phase of the production of alloy metals.

If you are still using scrap for your alloy requirements, ask us about Alloymet pig of certified analysis.

ALLOY
METAL PRODUCTS, Inc.
PHONE 6-2561 • TELETYPE DV 588

(FORMERLY A DIVISION OF **ALTER COMPANY**)
ROCKINGHAM ROAD
DAVENPORT, IOWA

World's largest producer of secondary nickel alloys of certified analysis

Steel Stocks Improve

(Per cent of respondents)

Arrows show dominant trends since STEEL's last report.	Less than 10 days	10-30 days	30-60 days	60-90 days	3-6 months
Hot-rolled carbon bars	2 —	21 →	46 —	22 —	9
Cold-finished bars	0 →	30 ←	42 —	19 —	9
Hot & cold-rolled sheets, strip	4 —	11 →	38 ←	41 —	6
Light plates	10 —	26 —	34 —	20 →	10
Heavy plates	11 —	33 →	46 ←	5 —	5
Structural shapes	9 —	35 —	32 —	15 →	9

Legend: Inventories of average metal user are in white block.

Buyers Become Optimistic

They are able to build or cut stocks almost at will (except in plates and structurals). Look for the picture to keep improving, at least through the next quarter

PLATES and structurals still dominate the inventory scene, although supplies are better than they were 90 days ago, reveals STEEL's quarterly survey of stocks.

Three months ago (STEEL, Nov. 5, 1956, p. 177) the average metal user held a 10 to 30-day supply of those hard-to-get items. Today, he has moved up to the 30 to 60-day category (see table).

Big Move—Most of STEEL's respondents who wanted to get out of the less-than-ten-day class have apparently been able to do so. Last quarter, 20 per cent of the heavy plate users and 27 per cent of the structural users held stocks in that class; now only 11 per cent and 9 per cent are there.

The situation is toughest in structurals. Almost 20 per cent complain of slow deliveries. That compares with the 25 per cent who had trouble last quarter.

Better than 15 per cent of the respondents report trouble with mill or warehouse deliveries of light and heavy plates.

Says a California purchasing agent: "Mill quantities of plates are not adequate, and deliveries run 30 to 60 days delinquent."

Comments an Illinois buyer: "Heavy plates and most heavier structurals are difficult to obtain at the warehouse level."

In General—Deliveries have improved over those of last quarter; 30 per cent found deliveries generally inadequate then. Only 16 per cent put themselves in that category now. Users of cold-finished bars are tending to trim stocks to a 10 to 30-day supply because of the better situation.

Hot and cold-rolled sheets and strip are being held at about the same inventory levels as last quarter. Some movement into the 60 ter. Some movement into the 60 rolled carbon bars, as well as in welded and seamless tubing.

About 5 per cent of the respondents are experiencing some shortages of stainless sheets and strip, but supplies are generally stable in the 30 to 60-day level.

Copper, Aluminum—Buyers find copper and aluminum products adequate. About 50 per cent are maintaining 30 to 60-day inventories. Some 20 per cent cut copper stocks last quarter; about 25 per cent cut aluminum inventories.

No copper users plan to cut stocks next quarter; few aluminum users will. Some will raise stocks: About 10 per cent of the copper users; almost 15 per cent of the aluminum users.

Outlook — There's little pessimism about the next quarter among steel users, except in plates and structurals — almost 25 per cent of the respondents feel this part of the inventory picture will worsen. An equal number think it will get better. Light plate buyers are much more optimistic than heavy plate buyers.

Where stock cutting began last quarter, it will tend to continue into the next. The Detroit buying picture is of prime importance here. Thus notes a Lansing, Mich., purchasing agent: "I hope (and expect) to reduce steel inventories by 35 per cent in the next 90 days. The flat-rolled market is really soft in this area."

Sheets, Strip . . .

Sheet & Strip Prices, Pages 160 & 161

Almost all types of steel users—barring those of heavy plates and shapes—are cancelling or pushing back shipments to some degree, it is reported at Chicago. This doesn't mean business is going to pot. Explanation: Because mill deliveries are easier, it isn't necessary to carry more than comfortable working inventories.

Auto builders have good stocks and are gearing intake with assembly line needs. Demand for appliances is off, and finished goods inventories are ample. This results in reduced steel buying.

Sheet sellers generally have opened books for the second quarter, but specifications are coming through slowly. Consumer inventories are substantial even in the major grades.

Most producers think second quarter shipments will be lighter. Most mills are offering more tonnage for the period than they did for the current three months, reflecting lagging buying interest by auto builders and appliance makers in particular.

Galvanized sheet specifications

are expected to improve gradually as spring nears.

L. H. Hamaker, general manager of sales, Republic Steel Corp., Cleveland, discounts the drop in auto buying. He says there is more alarm than the situation justifies, holding that January orders were ahead of shipments. The auto industry is merely readjusting work with smaller inventories since steel is easier to get, he said.

Additional cold-rolled facilities at Conshohocken, Pa. (Alan Wood Steel Co.) will not get into operation before March.

Steel Bars . . .

Bar Prices, Page 159

Upward revisions in extras for steel bars are being put into effect. Youngstown Sheet & Tube Co., Youngstown, announced advances in extras for size, chemistry and various special features on hot-rolled merchant quality carbon bars and hot-rolled special quality carbon bars and small shapes. Jan. 29 was the effective date. Size extras on concrete reinforcing bars also were increased. Extras for size, chemistry and special features applicable to high strength steel bars and small shapes were raised also.

Republic Steel Corp., Cleveland, effective Jan. 25, made certain changes in its list of extras for hot-rolled carbon and alloy steel bars, and semifinished steel. Changes in extras for alloy grades will bring advances averaging less than 1 per cent. The average hike in the carbon grades will be approximately 4 per cent. Changes on the carbon grades concern size and chemical properties; changes in the alloy grades concern only size.

Carbon steel bars in all classifications are becoming more readily available. However, the March-April rolling cycle at most production points, including the Chicago area, is full. But cold finishers are running well below full capacity and are seeking business aggressively. They no longer are confronted with the problem of getting in hot-rolled bars.

Although on the easy side, hot-rolled carbon bar business is still good. Mills have opened books for the second quarter.

Wire . . .

Wire Prices, Pages 161 & 162

Anticipating last-minute and concentrated demands for highway wire products, a few states are paying contractors for welded wire fabric to be stored for placement later. But this action covers only a small fraction of the estimated 290,000 tons that will be required in 1957, including pipe reinforcing.

The market for upholstery wire has not perked up, but the mills, notably the St. Louis area works, finished out January with a satisfactory volume of business. Order books are not completely filled for February. Reports from Chicago and other points indicate that good business is anticipated over coming months.

While wire mills are not running full blast and have open space in their books on all products, merchant product shipments in January were up 10 to 15 per cent over those of the same month

and . . .

RUBBER

BABY

BUGGY

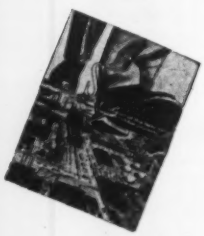
BUMPERS

All rubber part requirements are not unusual. Yes . . . we have produced parts in rubbers that have traveled far into space on our fastest jet fighters and bombers . . . and we regularly produce parts that meet the requirements of the family auto.

Stalwart is comprised of rubber specialists. Men who are capable of compounding specialized rubbers that can be fabricated into the parts and products that you produce. Production men will see to it that these parts are made to exacting specifications and delivered to you at the right price.

Check with STALWART FIRST . . . if you have a rubber part problem involving temperatures, abrasion, weathering, chemicals, petroleums or a combination of these. Check with STALWART FIRST . . . if the part is intricate . . . or if it is just a . . . rubber baby buggy bumper!

Write today for your copy of 56-SR-3.



7330-SR

STALWART RUBBER COMPANY

Manufacturing Plants in Bedford, Ohio and Jasper, Georgia
Main Offices at 167 Northfield Road • Bedford, Ohio

a year ago. A better year in merchant products looms ahead with the economic position of farmers somewhat improved.

Barbed wire output is hurt by the fact that about 40 per cent of all the tonnage sold last year was imported from Belgium, Germany and Japan.

Shipments of manufacturers wire products are down about 25 per cent from those a year ago.

Alloy Steel . . .

Alloy steel output during 1956 totaled 10,380,941 net tons, reports the American Iron & Steel Institute. This compares with 10,660,091 tons in 1955, and with 13,149,818 tons in record 1943.

Stainless Steel . . .

Stainless Steel Prices, Page 163

Republic Steel Corp., Cleveland, has revised its base price card on stainless and heat resisting steel, incorporating changes on hot-rolled rods in coils and cold-finished wire ½-in. and under.

Tubular Goods . . .

Tubular Goods Prices, Page 163

Jones & Laughlin Steel Corp., Pittsburgh, has revised prices upward on O.D. seamless pipe $4 to $6 a ton. Also increased were extra charges for all sizes of high test API 5-LX grades of line pipe. The changes, which are similar to those announced by other producers, became effective Jan. 22. The company will continue to equalize freight charges.

Buyers of oil country tubing are considering conversion deals to fill their requirements for the 1957 drilling season. Tube mills are opening their books for the second quarter. One major producer says it will be unable to care for more than 67 per cent of the orders it expects to receive for the period. The situation in high alloy tubes is critical.

Republic Steel Corp. has authorized a boost of about 4000 tons monthly in its continuous weld pipe mills at Youngstown, L. S. Hamaker, general manager of sales, reports. The company has a still larger expansion in the "talking" stage.

Plates . . .

Plate Prices, Page 159

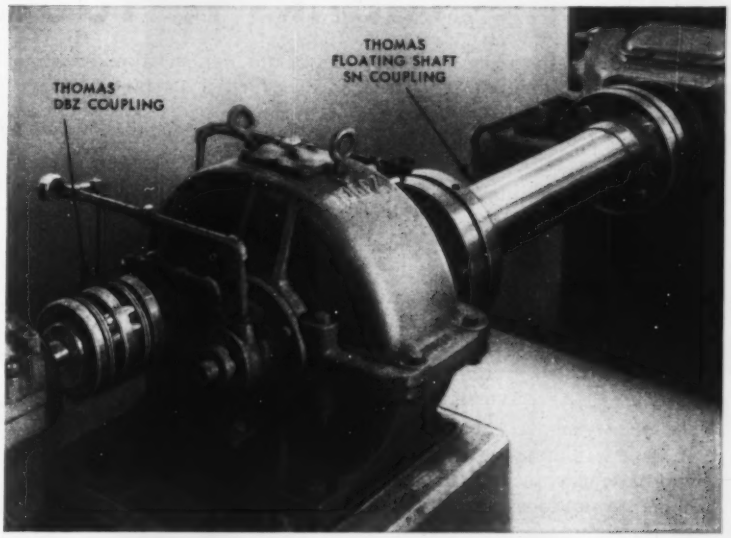
Light plates are not as difficult to get as they were. Further easing appears certain. Extra tonnage will be available in the second quarter from strip mills now devoting more rolling time to plates. Reason: Sheet demand, notably for cold rolled is lagging. Two mills in the Pittsburgh-Wheeling area are offering light plates up to 60-in. in width in the East.

No early easing in heavy plate supply appears likely. The Claymont, Del., producer (Colorado Fuel & Iron Corp.) is suspending operations at its smaller mill—its 120-in. unit—for two weeks for repairs and mechanical changes. A strike at plants of a leading oxygen supplier slowed down open-hearth production in at least one plate mill and also substantially reduced its flame cutting operations.

Clifford F. Hood, president, U.S. Steel Corp., Pittsburgh, said re-

THOMAS FLEXIBLE COUPLINGS

Give You Freedom From Coupling Maintenance



NO LUBRICATION NO MAINTENANCE NO WEARING PARTS

Future maintenance costs and shutdowns are eliminated when you install Thomas Flexible Couplings. These all-metal couplings are open for inspection while running.

They will protect your equipment and extend the life of your machines.

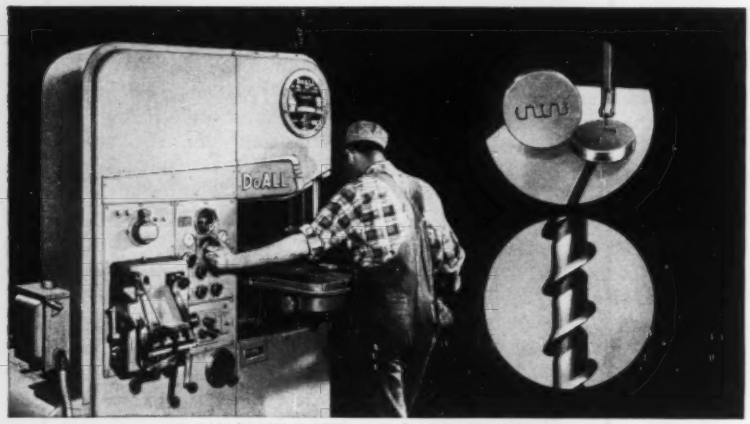
Properly installed and operated within rated conditions, Thomas Couplings should last a lifetime.

Under Load and Misalignment only Thomas Flexible Couplings offer all these advantages:

1 Freedom from Backlash Torsional Rigidity
2 Free End Float
3 Smooth Continuous Drive with Constant Rotational Velocity
4 Visual Inspection While in Operation
5 Original Balance for Life
6 No Lubrication
7 No Wearing Parts
8 No Maintenance

Write for Engineering Catalog 51A

THOMAS FLEXIBLE COUPLING COMPANY
WARREN, PENNSYLVANIA, U.S.A.



A 360° SAW BAND cuts in any direction . . .

All The Comforts of Home . . . Thanks to Tools

Aluminum used to be for pots and pans. Now aluminum provides many of the comforts of the home. Aluminum storm and window sash is a good example.

This growth of aluminum is a testimony to "tools." Tools that extract the aluminum-bearing bauxite and refine it. Tools that shape and form and extrude and cut the metal . . . fast at low cost. Tools have literally created the vast aluminum industry—and thereby created thousands of jobs that didn't exist before.

The picture above helps explain it. A man is employing industry's newest basic machine tool, the band machine, to produce intricate steel dies through which aluminum shapes are extruded. The frames for aluminum storm sash are squeezed out through such dies. (It's like squeezing toothpaste from a tube.)

After the DoALL band machine cuts out the shape in the die, the edges of the cut are filled to a fine finish. Since employing the DoALL machine with spiral band tool, sawing and filing is done in half the time previously required. The big saving in time helps keep down the price of aluminum products so that more people can afford them and the industry can continue to grow. The secret to the time saving lies in the high speed and accuracy of the DoALL machine and in the unique DoALL spiral saw band used on this particular job. The band has a 360° cutting edge. It cuts in any direction and makes a very smooth finish so that subsequent filing work is reduced.

There you have a vivid story of how tools make products at low cost for better living. And how tools create jobs.

DoALL band machines help make the price of lifetime aluminum storm and window sash a good bargain.

When manufacturers fight for fair profits and lower taxes, they are fighting mainly for money with which to buy tools. In the realm of machining metal, more and more manufacturers are turning to DoALL machines. When a job can be done on a band machine, it can usually be done at half or less the cost of doing it any other way. That benefits everyone.

Reprints of this series on economics available for your employees.

Slotting, splitting, cutting grinding reliefs, notching, contour cutting are a few of the jobs that can be done for less on new hydraulic feed DoALL Contourmatic band machines. Ask for literature and a *free demonstration* at your plant. Call DoALL locally, or write.

The DoALL Company
Des Plaines, Illinois
38 Local Sales-Service Stores E-20

cently: "Our forecasts indicate that production of plates and structurals, industry-wide, will amount to more than 15 million tons in 1957—an increase of nearly 50 per cent over the demand a little more than two years ago."

Warehouse . . .

Warehouse Prices, Page 164

Distributors have increased prices modestly on various products, including hot-rolled and cold-finished bars, and they expect to revise prices upward again to cover new advances in mill extras.

Demand is showing some improvement. This uptrend is expected to continue at least through March. Light plate, bars and hot-rolled sheets have become somewhat easier in supply.

Almost all users appear to have excellent stocks, except for buyers of heavy plate and shapes.

Structural Shapes . . .

Structural Shape Prices, Page 159

The awarding of 34,000 tons for the Galbreath-Ruffin office building, 33 W. 51st St., New York, is the top news in the structural steel market. The contract went to the American Bridge Division, U.S. Steel Corp., Pittsburgh.

Bridge work continues active. Bids have just closed on 4700 tons for six New York state projects. Several other New York state bridges were placed recently. Bridge inquiry is heavier in the northeast, with some 10,000 tons pending.

Structural shops are reluctant to build backlogs beyond six months in New England, and most of them are booked to that extent.

Fabricating costs are higher, reflecting increases in plain material prices through higher extras, up $10 per ton frequently.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 159

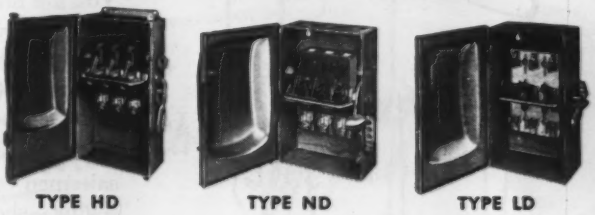
A leading Pittsburgh producer of reinforcing bars reports it holds only a two-month order backlog. Its backlog at this time last year was three to four months. The decrease is explained in part by an increase in the number of suppliers.

In addition, some construction is

FIRST with a COMPLETE LINE OF SAFETY SWITCHES to meet the NEW NEMA STANDARDS

• The table below shows Square D switches meeting new industry specifications. Notice how they clarify conflicting features which existed under old designations. Notice, too, that they establish a new, heavy-duty industrial switch, Type HD.

One important thing which remains unchanged is the **DESIGN LEADERSHIP** which has made **SQUARE D SAFETY SWITCHES** industry's overwhelming **FIRST** choice for more than fifty years. Compare them, feature for feature. They cost no more, why settle for less?



TYPE HD TYPE ND TYPE LD

DESCRIPTION	HEAVY DUTY New	NORMAL DUTY formerly Types H, S, or A	LIGHT DUTY formerly Types D or G
Rating-Ampere Voltage	30—600 250 or 600V AC, DC	30—1200 250 or 600V AC, DC	30—200 250V AC
Enclosure	NEMA 12 • Industrial Use (Gasketed) NEMA 4 & 5 • Water-tight & Dust-tight NEMA 7 • Explosion-resisting Class I—Group D NEMA 9 • Explosion-resisting	NEMA 1 • General Purpose NEMA 3R • Raintight	NEMA 1 • General Purpose NEMA 3R • Raintight
Horsepower Rating	NEC Fuse Ratings Dual-Element Fuse Ratings	NEC Fuse Rating Dual-Element Fuse Ratings	NEC Fuse Rating
Operating Mechanism	Quick-Make, Quick-Break Independent of Handle	Quick-Make, Quick-Break Independent of Handle	Positive Make, Positive Break Spring Assisted
Cover	Interlocked & Padlock Attachment	Interlocked & Padlock Attachment	Padlock Attachment
Plating—Current Parts	Extra-Heavy Silver	Silver	
Endurance	Maximum Endurance Far Exceeds UL Standards	Exceeds UL Standards	Meets UL Standards

NOW...EC&M PRODUCTS ARE A PART OF THE SQUARE D LINE!

SQUARE D COMPANY

$21 for a sales call —but how many dollars worth of SELL?

Recent surveys show that the average cost of a sales call is approximately $21. Costs in your company may be somewhat more or somewhat less—but the important question is "How much SELL are you getting for your sales call dollar?"

You are not getting full value unless you are giving industrial advertising a chance to do its proper share of the sales job—making continual contacts, arousing interest, creating preference for your company and its products.

If advertising is doing this part of the job, your salesmen can concentrate on the "climax steps" of selling—showing the prospect what your products will do for him, and getting his order.

The salesman always "carries the ball," but he gains more ground when a well-balanced advertising program "runs interference" for him.

NATIONAL INDUSTRIAL ADVERTISERS ASSOCIATION, INC.

271 Madison Avenue, New York 16, N. Y.

An organization of over 4000 members engaged in the advertising and marketing of industrial products, with local chapters in ALBANY, BALTIMORE, BOSTON, BUFFALO, CHICAGO, CLEVELAND, COLUMBUS, DALLAS-FORT WORTH, DENVER, DETROIT, HAMILTON, ONT., HARTFORD, HOUSTON, INDIANAPOLIS, LOS ANGELES, MILWAUKEE, MINNEAPOLIS-ST. PAUL, MONTREAL, QUE., NEWARK, NEW YORK, PHILADELPHIA, PITTSBURGH, PORTLAND, ROCHESTER, ROCKFORD, ST. LOUIS, SAN FRANCISCO, TORONTO, ONT., YOUNGSTOWN.

being delayed for lack of structural shapes.

Despite shortened backlogs, producers are confident highway building and industrial construction will provide strong volume demand this year.

Concrete bar demand is heavy in New England. The seasonal slack in buying is less in evidence than usual. Bookings point to heavy shipments beginning in March. For deformed bars in place, contractor estimates are higher, 18 cents to 20 cents per pound for 25 to 50 ton lots.

Ferroalloys . . .

Ferroalloy Prices, Page 166

Merritt-Chapman & Scott Corp. plans to expand its subsidiary, Tennessee Products & Chemical Corp. Construction of a ferroalloy plant costing $9 million is proposed. The plant will specialize in the production of chrome.

Semifinished Steel . . .

Semifinished Prices, Page 159

Interest in conversion deals is spreading among consumers. Users of oil country tubing who are unable to place full second quarter requirements are attempting to arrange conversion deals with producers of tube rounds.

Plate buyers also are actively seeking conversion tonnage.

Jones & Laughlin Steel Corp., Pittsburgh, has virtually dropped out of the semifinished market. It is not taking any semifinished orders and does not intend to accept any in the immediate future.

J&L has been trimming its sales of rerolling and forging billets, blooms and slabs in the open market for the last year.

The reason for this is that the company is using more steel in its own finishing operations, and it reports demand from those finishing operations alone keeps the supply of semifinished tight.

In the past year, J&L has added galvanized sheets and hot extruded bars to its list of products. It also has expanded its warehouse and container divisions.

Ingot production was curtailed somewhat in the Chicago area last week because of reduced oxygen supplies — they resulted from strikes in eastern plants of the Linde Air Products Co.

Iron Ore . . .

Iron Ore Prices, Page 165

Lake Superior iron ore prices for the 1957 lake shipping season will be 60 cents a ton higher. The Cleveland-Cliffs Iron Co., Cleveland, last week announced it had made substantial sales of ore for 1957 delivery at prices based on $11.45 a gross ton for Mesabi nonbessemer ore, delivered lower lake ports.

Base prices, effective Jan. 30, on ore delivered in the 1957 lake shipping season, standard grades containing 51.50 per cent iron natural, delivered rail of vessel, lower lake ports, as announced by John S. Wilbur, vice president-sales, the Cleveland-Cliffs company, are:

	Per gross ton
Mesabi range nonbessemer	$11.45
Mesabi range bessemer	11.60
Old range nonbessemer	11.70
Old range bessemer	11.85
Open hearth lump	12.70
High phos	11.45

The new prices are firm for shipments throughout the entire 1957 lake shipping season. Other shippers are expected to follow the Cleveland-Cliffs' action.

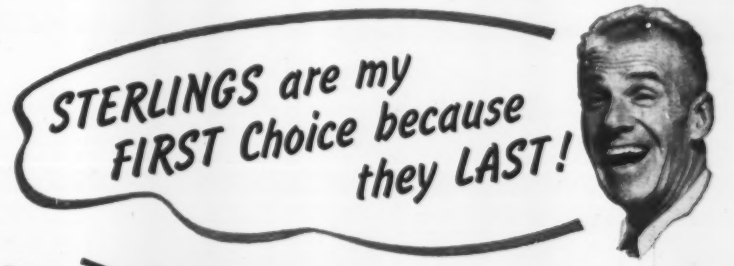
Mr. Wilbur, commenting on the increase of 60 cents per ton in prices, pointed out that transportation charges last year were increased 37 cents a ton. The railroads are asking for further increases and there is likely to be an increase in lake freight. In addition, labor rates were increased under the three-year contract entered into with the union last August, again in January, this year, and will go up still more in July.

Pig Iron . . .

Pig Iron Prices, Page 164

Blast furnace production in the U.S. last year totaled 75,965,475 net tons of pig iron and ferroalloys, reports the American Iron & Steel Institute. This was second only to the record 77,789,684 tons produced in 1955. Of the total, 75,301,134 tons were pig iron and 664,341 tons, blast furnace ferroalloys.

A monthly production record was set in December when the blast furnaces produced 7,334,584 net tons, of which 7,268,743 tons were pig iron and 65,841 tons, ferroalloys. Previous mark: The 7,315,-



For STAMINA, long-lasting ruggedness, you can't beat Sterling Wheelbarrows. Users say they seem to last "forever". Work them hard, overtime, in toughest service . . . you'll agree Sterlings survive hard punishment . . . again proving . . .

IT PAYS TO BUY THE BEST.

(Above) Model D3½S Maximum Capacity 3½ cu. ft. 16 gauge tray, all welded, no rivets, double lapped at corners. Steel channel legs. V-shaped front braces and brace support.

(Right) Model C5W Maximum Capacity 5 cu. ft. 16 gauge tray, all welded, no rivets, double lapped at corners. Heavy-duty malleable wheel guard.

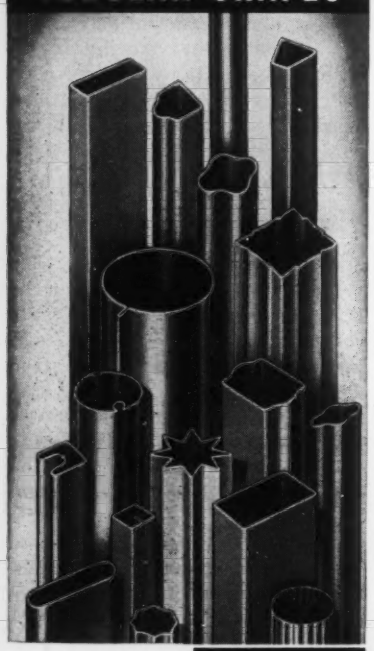
STERLING WHEELBARROW CO., Milwaukee 14, Wis.

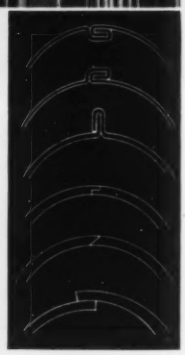
Look for this Mark of STERLING Quality

Sterling WHEELBARROWS

A 1879-14-R

COLD ROLL FORMING TUBULAR SHAPES





Among the wide variety of things you can make on a Yoder Cold Roll Forming machine are round, square, oval, rectangular and other tubular shapes, such as illustrated. The seams may be open, lapped, butted, dovetailed, interlocking, etc.—as shown in the drawing.

Millions of feet of such unwelded tubular shapes are made from coiled strip for conductor pipe, bedsteads, lamp stands, window channel, wiring raceways, carrying rods, etc. Production ranges from 20,000 to 50,000 feet per day, with only one operator and a helper.

Yoder offers you the cooperation of their engineering staff for designing and adapting their cold roll forming machines, auxiliaries, and tooling, for the low cost production of structurals, mouldings and trim, panels, tubular and other shapes, to meet individual needs.

The Yoder Book on Cold Roll Forming is a complete, illustrated text on the art and the equipment needed for performing a variety of operations which can be combined with cold roll forming, at little or no extra labor cost. A copy is yours for the asking.

THE YODER COMPANY
5502 Walworth Ave. Cleveland 2, Ohio

YODER COLD-ROLL FORMING MACHINES

559 net tons produced in October, 1956.

Failure of the automobile industry to step up orders for castings continues to be a drag on the merchant iron market. Over-all operations of foundries are spotty. Those serving the automotive industry report first quarter bookings are not up to expectations. Foundries serving the railroad equipment industry are receiving a good flow of business and have sizable backlogs.

Specifying lightly are the soil pipe and pressure pipe foundries.

The supply of southern iron in the Mid-Atlantic district continues to be hit by the strike at the Woodward furnaces in Birmingham (operations there have been suspended for three months). But, over-all, the supply of merchant iron remains in reasonable balance with demand.

Mystic Iron Works, Everett, Mass., resumed production Jan. 28 after a 27-day strike.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

34,000 tons, Galbreath-Ruffin Corp., office building, 33 West 51st St., New York, to the American Bridge Division, U.S. Steel Corp., Pittsburgh; Turner Construction Co. is general contractor.

5400 tons, plant addition, Union Carbide & Carbon Corp., South Charleston, W. Va., to Bethlehem Steel Co., Bethlehem, Pa.

3600 tons, also 170 tons, Colorado river bridge, to Judson, Pacific, Murphy, Emeryville, Calif.; general contract by Bureau of Reclamation to above firm jointly with Peter Kiewit Sons Co., $4,139,277; bids Dec. 19.

1090 tons, reduction pot cradles, aluminum plant, Olin Mathieson Chemical Corp., Hannibal, O., through F. H. McGraw & Co., general contractor, to the Reynolds Mfg. Co., Avonmore, Pa., and Fabweld Corp., Philadelphia.

1025 tons, state highway bridge, relocation U.S. 13, Plaster Creek and Pennsylvania railroad, Kent county, Michigan, to Bethlehem Steel Co., Bethlehem, Pa.

890 tons, New York University, Graduate School of Business Administration, Trinity and Cedar streets, New York, to an unnamed fabricator.

785 tons, bridge, Trout Creek, Mont., for a Washington (state) power company, through Ebasco Services, New York, to Allied Structural Steel Co.

760 tons, addition to the Seattle city light building, to Pacific Car & Foundry Co., Seattle, low at $427,700.

680 tons, state highway bridge, BP 56-4, Albany county, New York, through the Lane Construction Co., general contractor, to Ernst Iron Works, Buffalo.

660 tons, state bridge, BP 56-3, Rensselaer county, New York, through Grandview Construction Corp., to Ernst Iron Works, Buffalo.

600 tons, Navy pier, Newport, R.I., to Ingalls Iron Works, Birmingham; B. Perini & Sons Inc., Framingham, Mass., general contractor.

500 tons or more, 50 towers, Griffiss AFB, New York, to Dresser-Ideco Co., Columbus, O., $2,513,500.

400 tons, high school, Canton, Mass., to Waghorne-Browne Co. (Bethlehem Fabricators Inc.) Boston.

(*Please turn to page* 173)

MUNDT

a name with over 83 years experience ready to serve the industry at all times with the

PERFORATED

requirements necessary for your equipment, machinery or parts in any form or types of

METAL

or fibre, cardboard, paper, soundboards and other materials in a workmanlike manner that

MEANS

lasting performance, better quality, and above all a product that will give you a

PERFECT

job for the particular purpose for which it is to be used, without defects, burrs or camber to

SCREENS

because our up-to-date equipment, plus our engineering counsel gives you nothing but the best.

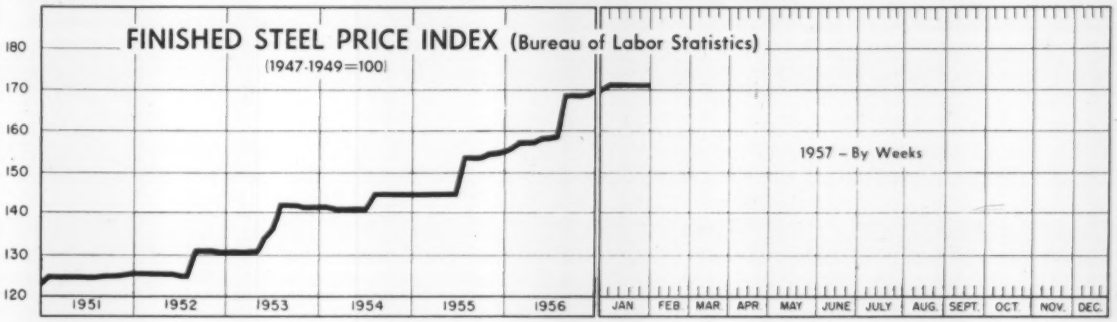
Specially Fabricated for **ALL INDUSTRIES** BY

CHARLES MUNDT & SONS

53 FAIRMOUNT AVE.
JERSEY CITY 4, N. J.
PHONE—DELAWARE 3-6300

Send for Illustrated Catalog

Price Indexes and Composites



171.7	171.6	171.1	171.1	157.0
Jan. 29, 1957	Week Ago	Month Ago	Jan. Avg.	Year Ago

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Jan. 29

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard, No. 1	$5.150
Rails, Light, 40 lb	6.567
Tie Plates	6.025
Axles, Railway	9.150
Wheels, Freight Car, 33 in. (per wheel)	57.50
Plates, Carbon	5.900
Structural Shapes	5.667
Bars, Tool Steel, Carbon (lb)	0.480
Bars, Tool Steel Alloy, Oil Hardening Die (lb)	0.585
Bars, Tool Steel, H.R., Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.274
Bars, Tool Steel, H.R., Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.769
Bars, H.R., Alloy	10.038
Bars, H.R., Stainless, 303 (lb)	0.508
Bars, H.R., Carbon	5.975
Bars, Reinforcing	5.738
Bars, C.F., Carbon	9.610
Bars, C.F., Alloy	13.300
Bars, C.F., Stainless, 302 (lb)	0.533
Sheets, H.R., Carbon	5.945
Sheets, C.R., Carbon	6.789
Sheets, Galvanized	8.220
Sheets, C.R., Stainless, 302 (lb)	0.660
Sheets, Electrical	11.225
Strip, C.R., Carbon	8.843
Strip, C.R., Stainless, 403 (lb)	0.475
Strip, H.R., Carbon	6.000
Pipe, Black, Buttweld (100 ft)	18.376
Pipe, Galv, Buttweld (100 ft)	22.516
Pipe, Line (100 ft)	182.860
Casing, Oil Well, Carbon (100 ft)	178.046
Casing, Oil Well, Alloy (100 ft)	276.870
Tubes, Boiler (100 ft)	45.033
Tubing, Mechanical, Carbon (100 ft)	23.028
Tubing, Mechanical, Stainless, 304 (100 ft)	189.113
Tin Plate, Hot-dipped, 1.25 lb	9.433
Tin Plate, Electrolytic, 0.25 lb	8.133
Black Plate, Canmaking Quality	7.233
Wire, Drawn, Carbon	9.175
Wire, Drawn, Stainless, 430 (lb)	0.630
Bale Ties (bundle)	7.213
Nails, Wire, 8d Common	9.365
Wire, Barbed (80-rod spool)	8.412
Woven Wire Fence (20-rod roll)	20.505

STEEL's FINISHED STEEL PRICE INDEX*

	Jan. 30 1957	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	225.92	225.92	225.92	209.10	171.92
Index in cents per lb	6.111	6.111	6.111	5.655	4.657

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel NT*	$137.98	$137.98	$137.98	$127.91	$106.32
No. 2 Fdry Pig Iron, GT	62.63	62.63	62.63	58.99	52.54
Basic Pig Iron, GT	62.18	62.18	62.18	58.49	52.16
Malleable Pig Iron, GT	63.41	63.41	63.41	59.77	53.27
Steelmaking Scrap, GT	56.00	59.17	63.17	50.50	43.00

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Jan. 30 1957	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	5.075	5.075	5.075	4.65	3.70
Bars, H.R., Chicago	5.075	5.075	5.075	4.65	3.70
Bars, H.R., deld, Philadelphia	5.365	5.365	5.365	4.90	4.223
Bars, C.F., Pittsburgh	6.85*	6.85*	6.85*	6.25	4.55
Shapes, Std., Pittsburgh	5.00	5.00	5.00	4.60	3.65
Shapes, Std., Chicago	5.00	5.00	5.00	4.60	3.65
Shapes, deld., Philadelphia	5.31	5.31	5.31	4.85	3.918
Plates, Pittsburgh	4.85	4.85	4.85	4.50	3.70
Plates, Chicago	4.85	4.85	4.85	4.50	3.70
Plates, Coatesville, Pa.	5.25	5.25	5.25	4.80	4.15
Plates, Sparrows Point, Md.	4.85	4.85	4.85	4.50	3.70
Plates, Claymont, Del.	5.70	5.70	5.70	4.80	4.15
Sheets, H.R., Pittsburgh	4.675	4.675	4.675	4.325	3.60-3.75
Sheets, H.R., Chicago	4.675	4.675	4.675	4.325	3.60
Sheets, C.R., Pittsburgh	5.75	5.75	5.75	5.325	4.35
Sheets, C.R., Chicago	5.75	5.75	5.75	5.325	4.35
Sheets, C.R., Detroit	5.75-5.85	5.75-5.85	5.75-5.85	5.325-5.425	4.55
Sheets, Galv., Pittsburgh	6.30	6.30	6.30	5.85	4.80
Strip, H.R., Pittsburgh	4.675	4.675	4.675	4.325	3.75-4.00
Strip, H.R., Chicago	4.675	4.675	4.675	4.325	3.50
Strip, C.R., Pittsburgh	6.85	6.85	6.85	6.25	4.65-5.35
Strip, C.R., Chicago	6.85	6.85	6.85	6.25-6.35	4.90
Strip, C.R., Detroit	6.95	6.95	6.95	6.35	4.85-5.60
Wire, Basic, Pittsburgh	7.20	7.20	7.20	6.60	4.85-5.10
Nails, Wire, Pittsburgh	8.20	8.20	8.20	7.60	5.90-6.20
Tin plate (1.50 lb), box, Pitts.	$9.95	$9.95	$9.95	$9.45	$8.70

*Including 0.35c for special quality

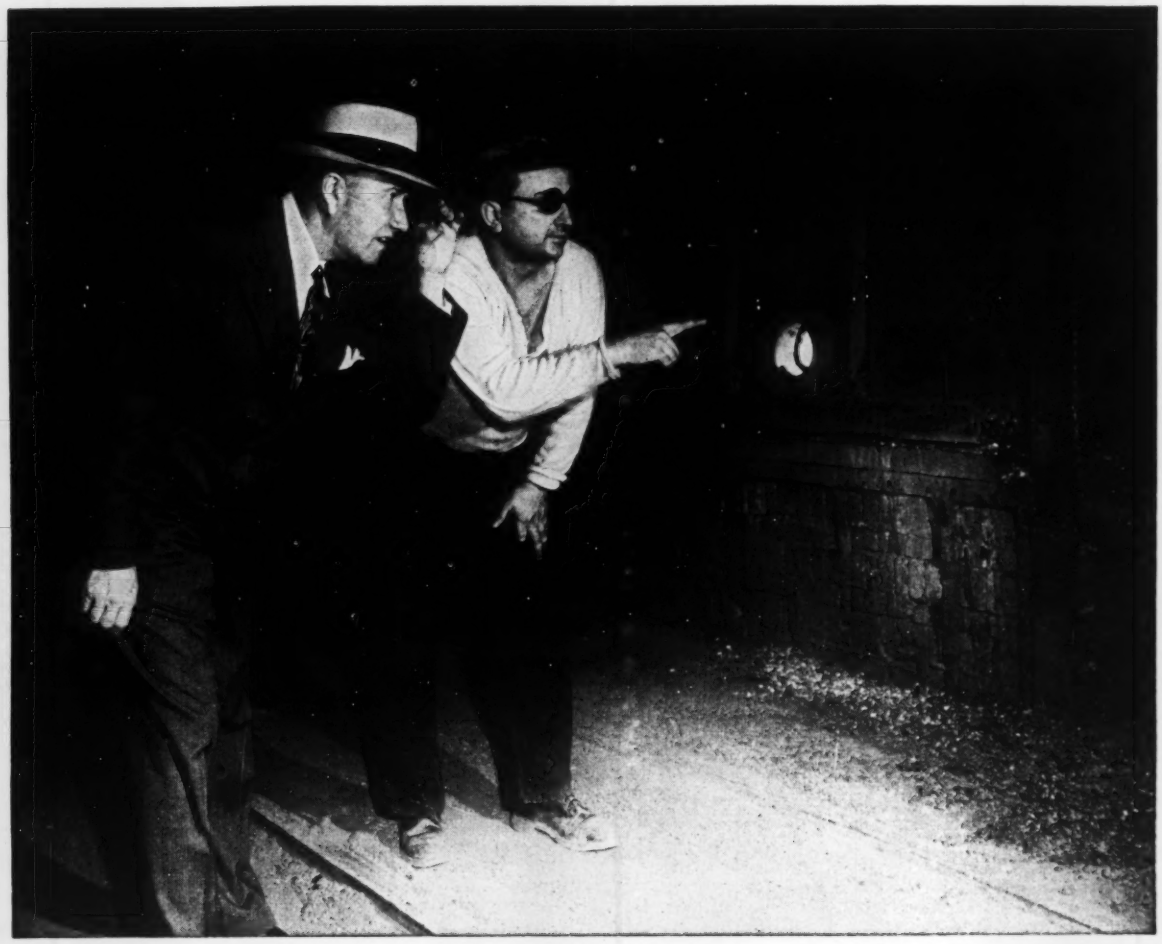
SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$91.50	$91.50	$91.50	$84.50	$66.00
Wire rods, ⅜-⅝" Pitts.	5.80	5.80	5.80	5.025-5.375	4.10-4.30

PIG IRON, Gross Ton	Jan. 30 1957	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bessemer, Pitts.	$63.50	$63.50	$63.50	$59.50	$53.00
Basic, Valley	62.50	62.50	62.50	58.50	52.00
Basic, deld., Phila.	66.26	66.26	66.26	62.16	56.61
No. 2 Fdry, NevilleIsland,Pa.	63.00	63.00	63.00	59.00	52.50
No. 2 Fdry, Chicago	63.00	63.00	63.00	59.00	52.50
No. 2 Fdry, deld., Phila.	66.76	66.76	66.76	62.66	57.11
No. 2 Fdry, Birm.	59.00	59.00	59.00	55.00	48.88
No. 2 Fdry (Birm.) deld. Cin.	66.70	66.70	66.70	62.70	55.49
Malleable, Valley	63.00	63.00	63.00	59.00	52.50
Malleable, Chicago	63.00	63.00	63.00	59.00	52.50
Ferromanganese, Duquesne.	255.00†	255.00†	255.00†	205.00†	188.00*

†74-76% Mn, net ton. *75-82% Mn, gross ton, Etna, Pa.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pittsburgh	$54.50	$61.50	$62.50	$49.50	$44.00
No. 1 Heavy Melt, E. Pa.	59.00	59.00	63.00	53.00	42.50
No. 1 Heavy Melt, Chicago	54.50	57.00	64.00	49.00	42.50
No. 1 Heavy Melt, Valley	56.50	63.50	66.50	54.50	44.00
No. 1 Heavy Melt, Cleve.	53.50	60.50	63.50	52.00	43.00
No. 1 Heavy Melt, Buffalo	59.50	61.50	62.50	47.50	43.00
Rails, Rerolling, Chicago	71.50	72.50	59.50	69.00	52.50
No. 1 Cast, Chicago	48.50	48.50	59.50	48.50	49.00

COKE, Net Ton					
Beehive, Furn, Connlsvl.	$15.00	$15.00	$15.00	$14.125	$14.75
Beehive, Fdry, Connlsvl.	18.00	18.00	18.00	16.50	17.50



"One of our important tools in making steel is the Business Press"

says CLIFFORD F. HOOD, President, United States Steel Corporation

"Producing quality steel in quantities to meet today's tremendous needs is a complex technical job. An army of specialists with precision equipment has replaced the old-time melter and roller. It is the *knowledge and ability* of these men and women of specialized skills which has enabled America's steel industry to outproduce the world.

"America's Business Press is just as much a part of their equipment as the modern instruments and mills which produce the steel. With the constant interchange of ideas from their specialized magazines, our people in the steel industry *from top management right down the line* are able to keep abreast of the march of steel progress."

You will find that top men like Mr. Hood, in every industry use business publications as a prime source of information about their own industry and their markets. And they not only read the editorial content, but they also place equal weight on your advertising message – for there, too, they find valuable information.

Write for list of NBP publications – see how you can pin-point your market through the use of these technical, scientific, industrial, merchandising and marketing magazines.

NBP

NATIONAL BUSINESS PUBLICATIONS, INC.

1413 K Street, N. W., Washington 5, D. C. • STerling 3-7535

Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. *Changes shown in italics.* Code numbers following mill points indicate producing company. Key to producers, page 160; to footnotes, page 162.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)

Munhall, Pa. U5 ..... $70.50

INGOTS, Alloy (NT)

Detroit R7 ..... $74.00
Houston S5 ..... 74.00
Midland, Pa. C18 ..... 74.00
Munhall, Pa. U5 ..... 74.00

BILLETS, BLOOMS & SLABS Carbon, Rerolling (NT)

Bessemer, Pa. U5 ..... $74.00
Bridgeport, Conn. N19 .. 79.00
Buffalo R2 ..... 74.00
Clairton, Pa. U5 ..... 74.00
Ensley, Ala. T2 ..... 74.00
Fairfield, Ala. T2 ..... 74.00
Fontana, Calif. K1 ..... 83.50
Gary, Ind. U5 ..... 74.00
Johnstown, Pa. B2 ..... 74.00
Lackawanna, N.Y. B2 .. 74.00
LoneStar, Tex. L6 .... 80.00
Munhall, Pa. U5 ..... 74.00
S. Chicago, Ill. R2, U5 .. 74.00
S. Duquesne, Pa. U5 ... 74.00
Sterling, Ill. N15 ..... 74.00
Youngstown R2 ..... 74.00

Carbon, Forging (NT)

Bessemer, Pa. U5 ..... $91.50
Bridgeport, Conn. N19 .. 96.50
Buffalo R2 ..... 91.50
Canton, O. R2 ..... 94.00
Clairton, Pa. U5 ..... 91.50
Conshohocken, Pa. A3 .. 96.50
Ensley, Ala. T2 ..... 91.50
Fairfield, Ala. T2 ..... 91.50
Fontana, Calif. K1 .... 101.00
Gary, Ind. U5 ..... 91.50
Geneva, Utah C11 ..... 91.50
Houston S5 ..... 96.50
Johnstown, Pa. B2 ..... 91.50
Lackawanna, N.Y. B2 .. 91.50
LosAngeles B3 ..... 101.00
Midland, Pa. C18 ..... 91.50
Munhall, Pa. U5 ..... 91.50
Seattle B3 ..... 105.00
S. Chicago R2, U5, W14 91.50
S. Duquesne, Pa. U5 .... 91.50
S. SanFrancisco B3 ... 101.00

Alloy, Forging (NT)

Bethlehem, Pa. B2 .. $107.00
Bridgeport, Conn. N19 107.00
Buffalo R2 ..... 107.00
Canton, O. R2 ..... 107.00
Conshohocken, Pa. A3 .114.00
Detroit R7 ..... 107.00
Fontana, Calif. K1 .... 128.00
Gary, Ind. U5 ..... 107.00
Houston S5 ..... 112.00
Ind. Harbor, Ind. Y1 .. 107.00
Johnstown, Pa. B2 .... 107.00
Lackawanna, N.Y. B2 .. 107.00
LosAngeles B3 ..... 127.00
Massillon, O. R2 ..... 107.00
Midland, Pa. C18 .... 107.00
Munhall, Pa. U5 ..... 107.00
S. Chicago R2, U5, W14 107.00
S. Duquesne, Pa. U5 .. 107.00
Struthers, O. Y1 ..... 107.00
Warren, O. C17 ..... 107.00

ROUNDS, SEAMLESS TUBE (NT)

Bridgeport, Conn. N19 $116.50
Buffalo R2 ..... 111.50
Canton, O. R2 ..... 114.00
Cleveland, O. R2 ..... 111.50
Gary, Ind. U5 ..... 111.50
S. Chicago, Ill. R2, W14 111.50
S. Duquesne, Pa. U5 .. 111.50

SKELP

Aliquippa, Pa. J5 .... 4.725
LoneStar, Tex. L6 .... 5.025
Munhall, Pa. U5 ..... 4.625
SparrowsPoint, Md. B2 . 4.625
Warren, O. R2 ..... 4.625
Youngstown R2, U5 .. 4.625

WIRE RODS

AlabamaCity, Ala. R2 .. 5.80
Aliquippa, Pa. J5 ..... 5.80
Alton, Ill. L1 ..... 6.00
Buffalo W12 ..... 5.80
Cleveland A7 ..... 5.80
Donora, Pa. A7 ..... 5.80
Fairfield, Ala. T2 ..... 5.80
Houston S5 ..... 6.05
IndianaHarbor, Ind. Y1 .5.80
Johnstown, Pa. B2 ..... 5.80
Joliet, Ill. A7 ..... 5.80
KansasCity, Mo. S5 .... 6.05
Kokomo, Ind. C16 ..... 5.90
LosAngeles B3 ..... 6.60
Minnequa, Colo. C10 .... 6.05
Monessen, Pa. P7 ..... 5.80
N. Tonawanda, N.Y. B11 .5.80
Pittsburg, Calif. C11 .... 6.45
Portsmouth, O. P12 .... 5.80
Roebling, N.J. R5 ..... 5.90
S. Chicago, Ill. R2 ..... 5.80
SparrowsPoint, Md. B2 .. 5.90
Sterling, Ill. (1) N15 .... 5.80
Sterling, Ill. N15 ..... 5.90
Struthers, O. Y1 ..... 5.80
Worcester, Mass. A7 .... 6.10

STRUCTURALS

Carbon Steel Std. Shapes

Ala. City, Ala. R2 ..... 5.00
Aliquippa, Pa. J5 ..... 5.00
Bessemer, Ala. T2 ..... 5.00
Bethlehem, Pa. B2 ..... 5.05
Birmingham C15 ..... 5.30
Clairton, Pa. U5 ..... 5.00
Fairfield, Ala. T2 ..... 5.00
Fontana, Calif. K1 ..... 5.75
Gary, Ind. U5 ..... 5.00
Geneva, Utah C11 ..... 5.00
Houston S5 ..... 5.10
Ind. Harbor, Ind. I-2 .... 5.00
Johnstown, Pa. B2 ..... 5.05
KansasCity, Mo. S5 .... 5.10
Lackawanna, N.Y. B2 .. 5.05
LosAngeles B3 ..... 5.70
Minnequa, Colo. C10 .... 5.30
Munhall, Pa. U5 ..... 5.00
Niles, Calif. P1 ..... 5.75
Phoenixville, Pa. P4 .... 5.85
Portland, Oreg. O4 ..... 5.80
Seattle B3 ..... 5.75
S. Chicago, Ill. U5, W14 .5.00
S. SanFrancisco B3 .... 5.65
Sterling, Ill. N15 ..... 5.00
Torrance, Calif. C11 .... 5.70
Weirton, W. Va. W6 .... 5.00

Wide Flange

Bethlehem, Pa. B2 ..... 5.05
Clairton, Pa. U5 ..... 5.00
Fontana, Calif. K1 ..... 5.90
IndianaHarbor, Ind. I-2 .. 5.25
Lackawanna, N.Y. B2 .. 5.05
Munhall, Pa. U5 ..... 5.00
Phoenixville, Pa. P4 .... 5.85
S. Chicago, Ill. U5 ..... 5.00

Alloy Std. Shapes

Aliquippa, Pa. J5 ..... 6.20
Clairton, Pa. U5 ..... 6.20
Gary, Ind. U5 ..... 6.20
Houston S5 ..... 6.30
Munhall, Pa. U5 ..... 6.20
S. Chicago, Ill. U5 ..... 6.20

H.S., L.A. Std. Shapes

Aliquippa, Pa. J5 ..... 7.35
Bessemer, Ala. T2 ..... 7.35
Bethlehem, Pa. B2 ..... 7.40
Clairton, Pa. U5 ..... 7.35
Fairfield, Ala. T2 ..... 7.35
Fontana, Calif. K1 ..... 8.10
Gary, Ind. U5 ..... 7.35
Geneva, Utah C11 ..... 7.35
Houston S5 ..... 7.45
Ind. Harbor, Ind. I-2, Y1 7.35
Johnstown, Pa. B2 ..... 7.40
KansasCity, Mo. S5 .... 7.45
Lackawanna, N.Y. B2 .. 7.40
LosAngeles B3 ..... 8.05
Munhall, Pa. U5 ..... 7.35
Seattle B3 ..... 8.10
S. Chicago, Ill. U5, W14 .. 7.35
S. SanFrancisco B3 .... 8.00
Struthers, O. Y1 ..... 7.35

H.S., L.A. Wide Flange

Bethlehem, Pa. B2 ..... 7.40
Ind. Harbor, Ind. I-2 .... 7.35
Lackawanna, N.Y. B2 .. 7.40
Munhall, Pa. U5 ..... 7.35
S. Chicago, Ill. U5 ..... 7.35

PILING

BEARING PILES

Bethlehem, Pa. B2 ..... 5.05
Lackawanna, N.Y. B2 .. 5.05
Munhall, Pa. U5 ..... 5.00
S. Chicago, Ill. U5 ..... 5.00

STEEL SHEET PILING

Ind. Harbor, Ind. I-2 ... 5.90
Lackawanna, N.Y. B2 .. 5.90
Munhall, Pa. U5 ..... 5.90
S. Chicago, Ill. U5 ..... 5.90

PLATES

PLATES, Carbon Steel

Ala. City, Ala. R2 ..... 4.85
Aliquippa, Pa. J5 ..... 4.85
Ashland, Ky. (15) A10 .. 4.85
Bessemer, Ala. T2 ..... 4.85
Bridgeport, Conn. N19 .. 4.75
Clairton, Pa. U5 ..... 4.85
Claymont, Del. C22 ..... 5.70
Cleveland J5, R2 ..... 4.95
Coatesville, Pa. L7 ..... 5.25
Conshohocken, Pa. A3 ... 4.95
Detroit M1 ..... 4.95
Ecorse, Mich. G5 ..... 4.95
Fairfield, Ala. T2 ..... 4.85
Fontana, Calif. (30) K1 .. 5.60
Gary, Ind. U5 ..... 4.85
Geneva, Utah C11 ..... 4.85
GraniteCity, Ill. G4 .... 5.05
Harrisburg, Pa. P4 .... 5.80
Houston S5 ..... 4.95
Ind. Harbor, Ind. I-2, Y1 .4.85
Johnstown, Pa. B2 ..... 4.85
Lackawanna, N.Y. B2 .. 4.85
LoneStar, Tex. L6 ..... 5.20
Minnequa, Colo. C10 .... 5.70
Munhall, Pa. U5 ..... 4.85
Newport, Ky. A2 ..... 4.85
Pittsburgh J5 ..... 4.85
Riverdale, Ill. A1 ..... 4.85
Seattle B3 ..... 5.75
Sharon, Pa. S3 ..... 4.85
S. Chicago, Ill. U5, W14 .4.85
SparrowsPoint, Md. B2 .. 4.85
Steubenville, O. W10 .... 4.85
Warren, O. R2 ..... 4.85
Weirton, W. Va. W6 .... 4.85
Youngstown R2, U5, Y1 4.85

PLATES, Carbon Abras. Resist.

Claymont, Del. C22 ..... 6.20
Fontana, Calif. K1 ..... 6.75
Geneva, Utah C11 ..... 6.00
Johnstown, Pa. B2 ..... 5.65
SparrowsPoint, Md. B2 .. 5.65

PLATES, Wrought Iron

Economy, Pa. B14 .... 11.128

Plates, High-Strength Low-Alloy

Aliquippa, Pa. J5 ..... 7.25
Bessemer, Ala. T2 ..... 7.25
Clairton, Pa. U5 ..... 7.25
Claymont, Del. C22 ..... 7.55
Cleveland J5, R2 ..... 7.25
Coatesville, Pa. L7 ..... 7.55
Conshohocken, Pa. A3 ... 7.25
Ecorse, Mich. G5 ..... 7.35
Fairfield, Ala. T2 ..... 7.25
Fontana, Calif. (30) K1 .. 8.00
Gary, Ind. U5 ..... 7.25
Geneva, Utah C11 ..... 7.25
Houston S5 ..... 7.35
Ind. Harbor, Ind. I-2, Y1 7.25
Johnstown, Pa. B2 ..... 7.25
Munhall, Pa. U5 ..... 7.25
Pittsburgh J5 ..... 7.25
Seattle B3 ..... 8.15
Sharon, Pa. S3 ..... 7.25
S. Chicago, Ill. U5, W14 .7.25
SparrowsPoint, Md. B2 .. 7.25
Warren, O. R2 ..... 7.25
Youngstown U5, Y1 .... 7.25

PLATES, Alloy

Aliquippa, Pa. J5 ..... 6.85
Bridgeport, Conn. N19 .. 6.85
Claymont, Del. C22 .... 6.85
Coatesville, Pa. L7 .... 6.85
Fontana, Calif. (30) K1 .. 7.60
Gary, Ind. U5 ..... 6.85
Houston S5 ..... 6.95
Ind. Harbor, Ind. Y1 .... 6.85
Johnstown, Pa. B2 ..... 6.85
Munhall, Pa. U5 ..... 6.85
Newport, Ky. A2 ..... 6.85
Pittsburgh J5 ..... 6.85
Seattle B3 ..... 7.75
Sharon, Pa. S3 ..... 6.85
S. Chicago, Ill. U5, W14 .6.85
SparrowsPoint, Md. B2 .. 6.85
Youngstown Y1 ..... 6.85

FLOOR PLATES

Cleveland J5 ..... 5.925
Conshohocken, Pa. A3 .. 5.925
Harrisburg, Pa. P4 .... 6.275
Ind. Harbor, Ind. I-2 .. 5.925
Munhall, Pa. U5 ..... 5.925
S. Chicago, Ill. U5 .... 5.925

PLATES, Ingot Iron

Ashland c.l. (15) A10 .. 5.10
Ashland l.c.l. (15) A10 .. 5.60
Cleveland c.l. R2 ..... 5.60
Warren, O. c.l. R2 ..... 5.60

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)

Ala. City, Ala. (9) R2 .. 5.075
Aliquippa, Pa. (9) J5 .. 5.075
Alton, Ill. L1 ..... 5.275
Atlanta (9) A11 ..... 5.575
Bessemer, Ala. (9) T2 .. 5.075
Birmingham (9) C15 .. 5.375
Bridgeport, Conn. N19 .. 5.30
Buffalo (9) R2 ..... 5.075
Clairton, Pa. U5 ..... 5.075
Cleveland (9) R2 ..... 5.075
Ecorse, Mich. (9) G5 ... 5.175
Emeryville, Calif. J7 .. 5.85
Fairfield, Ala. (9) T2 .. 5.075
Fairless, Pa. (9) U5 .... 5.225
Fontana, Calif. (9) K1 .. 5.775
Gary, Ind. (9) U5 ..... 5.075
Geneva, Utah (9) C11 ... 5.175
Houston (9) S5 ..... 5.325
Ind. Harbor (9) I-2, Y1 .. 5.075
Johnstown, Pa. (9) B2 .. 5.075
Joliet, Ill. P22 ..... 5.575
KansasCity, Mo. (9) S5 .. 5.325
Lackawanna (9) B2 .... 5.075
LosAngeles (9) B3 .... 5.775
Milton, Pa. M18 ..... 5.225
Minnequa, Colo. C10 .... 5.525
Niles, Calif. P1 ..... 5.85
N. Tonawanda, N.Y. (9) B11 5.075
Pittsburg, Calif. (9) C11 .. 5.775
Pittsburgh (9) J5 ..... 5.075
Portland, Oreg. O4 ..... 5.85
Seattle B3, N14 ..... 5.825
S. Ch'c'go (9) R2, U5, W14 5.075
S. Duquesne, Pa. (9) U5 .. 5.075
S. SanFran., Calif. (9) B3 5.825
Sterling, Ill. (1) N15 .... 5.075
Sterling, Ill. N15 ..... 5.175
Struthers, O. Y1 ..... 5.075
Torrance, Calif. (9) C11 .. 5.775
Weirton, W. Va. (9) W6 .. 5.075
Youngstown (9) R2, U5 5.075

BARS, H.R. Leaded Alloy (Including leaded extra)

Warren, O. C17 ..... 7.125

BARS, Hot-Rolled Alloy

Aliquippa, Pa. J5 ..... 6.125
Bethlehem, Pa. B2 ..... 6.125
Bridgeport, Conn. N19 .. 6.20
Buffalo R2 ..... 6.125
Canton, O. R2 ..... 6.125
Clairton, Pa. U5 ..... 6.125
Detroit R7 ..... 6.125
Ecorse, Mich. G5 ..... 6.225
Fairless, Pa. U5 ..... 6.275
Fontana, Calif. K1 .... 7.175
Gary, Ind. U5 ..... 6.125
Houston S5 ..... 6.375
Ind. Harbor, Ind. I-2, Y1 6.125
Johnstown, Pa. B2 .... 6.125
KansasCity, Mo. S5 .... 6.375
Lackawanna, N.Y. B2 .. 6.125
LosAngeles B3 ..... 7.175
Massillon, O. R2 ..... 6.125
Midland, Pa. C18 ..... 6.125
Pittsburgh J5 ..... 6.125
S. Chicago R2, U5, W14 6.125
S. Duquesne, Pa. U5 .... 6.125
Struthers, O. Y1 ..... 6.125
Warren, O. C17 ..... 6.125
Youngstown U5 ..... 6.125

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy

Aliquippa, Pa. J5 ..... 7.425
Bessemer, Ala. T2 .... 7.425
Bethlehem, Pa. B2 .... 7.425
Bridgeport, Conn. N19 .. 7.50
Clairton, Pa. U5 ..... 7.425
Cleveland R2 ..... 7.425
Ecorse, Mich. G5 ..... 7.525
Fairfield, Ala. T2 ..... 7.425
Fontana, Calif. K1 .... 8.125
Gary, Ind. U5 ..... 7.425
Houston S5 ..... 7.675
Ind. Harbor, Ind. Y1 .... 7.425
Johnstown, Pa. B2 .... 7.425
KansasCity, Mo. S5 .... 7.675
Lackawanna, N.Y. B2 .. 7.425
LosAngeles B3 ..... 8.125
Pittsburgh J5 ..... 7.425
Seattle B3 ..... 8.175
S. Chicago, Ill. U5, W14 7.425
S. Duquesne, Pa. U5 .... 7.425
S. SanFrancisco B3 .... 8.175
Struthers, O. Y1 ..... 7.425
Youngstown U5 ..... 7.425

BAR SIZE ANGLES; H.R. Carbon

Bethlehem, Pa. (9) B2 .. 5.225
Houston S5 ..... 5.325
KansasCity, Mo. S5 .... 5.325
Lackawanna (9) B2 .... 5.075
Sterling, Ill. N15 ..... 5.175
Sterling, Ill. (1) N15 .. 5.075

BAR SIZE ANGLES; S. Shapes

Aliquippa, Pa. J5 ..... 5.075
Atlanta A11 ..... 5.575
Joliet, Ill. P22 ..... 5.10
Niles, Calif. P1 ..... 5.85
Pittsburgh J5 ..... 5.075
Portland, Oreg. O4 ..... 5.85
SanFrancisco S7 ..... 5.95

BAR SHAPES, Hot-Rolled Alloy

Aliquippa, Pa. J5 ..... 6.20
Clairton, Pa. U5 ..... 6.20
Gary, Ind. U5 ..... 6.20
Houston S5 ..... 6.45
KansasCity, Mo. S5 .... 6.45
Pittsburgh J5 ..... 6.20
Youngstown U5 ..... 6.20

BARS, C.F. Leaded Alloy (Including leaded extra)

Ambridge, Pa. W18 .... 9.475
BeaverFalls, Pa. M12 .. 9.475
Chicago W18 ..... 9.475
Cleveland C20 ..... 9.475
LosAngeles S30 ..... 11.10
LosAngeles P2 ..... 11.00
Monaca, Pa. S17 ..... 9.475
Newark, N.J. W18 .... 9.65
Warren, O. C17 ..... 9.475

BARS, Cold-Finished Carbon

Ambridge, Pa. W18 .... 6.85
BeaverFalls, Pa. M12, R2 6.85
Bridgeport, Conn. N19 .. 7.20
Buffalo B5 ..... 6.90
Camden, N.J. P13 ..... 7.30
Carnegie, Pa. C12 ..... 6.85
Chicago W18 ..... 6.85
Cleveland A7, C20 .... 6.85
Detroit B5, P17 ..... 7.05
Detroit R7 ..... 6.85
Donora, Pa. A7 ..... 6.85
Elyria, O. W8 ..... 6.85
FranklinPark, Ill. N5 .... 6.85
Gary, Ind. U5 ..... 6.85
GreenBay, Wis. F7 .... 6.85
Hammond, Ind. L2, M13 6.85
Hartford, Conn. R2 .... 7.35
Harvey, Ill. B5 ..... 6.85
LosAngeles (49) S30 .... 8.30
LosAngeles R2 ..... 8.75
LosAngeles P2 ..... 8.30
Mansfield, Mass. B5 .... 7.40
Massillon, O. R2, R8 .... 6.85
Midland, Pa. C18 ..... 6.85
Monaca, Pa. S17 ..... 6.85
Newark, N.J. W18 .... 7.30
NewCastle, Pa. (17) B4 .. 6.85
Pittsburgh J5 ..... 6.85
Plymouth, Mich. P5 .... 7.10
Putnam, Conn. W18 .... 7.40
Readville, Mass. C14 .... 7.40
S. Chicago, Ill. W14 .... 6.85
SpringCity, Pa. K3 ..... 7.30
Struthers, O. Y1 ..... 6.85
Waukegan, Ill. A7 ..... 6.85
Youngstown F3, Y1 .... 6.85

BARS, Cold-Finished Carbon (Turned and Ground)

Cumberland, Md. (5) C19 .6.10

BARS, Cold-Finished Alloy

Ambridge, Pa. W18 .... 8.325
BeaverFalls, Pa. M12, R2 8.325
Bethlehem, Pa. B2 .... 8.325
Bridgeport, Conn. N19 .. 8.475
Bufalo B5 ..... 8.325
Camden, N.J. P13 ..... 8.50
Canton, O. T7 ..... 8.325
Carnegie, Pa. C12 ..... 8.325
Chicago W18 ..... 8.325
Cleveland A7, C20 .... 8.325
Detroit B5, P17 ..... 8.525
Detroit R7 ..... 8.325
Donora, Pa. A7 ..... 8.325
Elyria, O. W8 ..... 8.325
FranklinPark, Ill. N5 .. 8.325
Gary, Ind. R2 ..... 8.325
GreenBay, Wis. F7 .... 8.326
Hammond, Ind. L2, M13 8.325
Hartford, Conn. R2 .... 8.625
Harvey, Ill. B5 ..... 8.325
Lackawanna, N.Y. B2 .. 8.325
LosAngeles P2, S30 .. 10.10
Mansfield, Mass. B5 .. 8.625
Massillon, O. R2, R8 .. 8.325
Midland, Pa. C18 ..... 8.325
Monaca, Pa. S17 ..... 8.325
Newark, N.J. W18 ..... 8.50
Plymouth, Mich. P5 .... 8.525
S. Chicago W14 ..... 8.325
SpringCity, Pa. K3 .... 8.50
Struthers, O. Y1 ..... 8.325
Warren, O. C17 ..... 8.325
Waukegan, Ill. A7 ..... 8.325
Worcester, Mass. A7 .. 8.625
Youngstown F3, Y1 .. 8.325

BARS, Reinforcing (To Fabricators)

Ala. City, Ala. R2 ..... 5.075
Atlanta A11 ..... 5.575
Birmingham C15 ..... 5.375
Bridgeport, Conn. N19 .. 5.30
Buffalo R2 ..... 5.075
Cleveland R2 ..... 5.075
Ecorse, Mich. G5 ..... 5.425
Emeryville, Calif. J7 .. 5.85
Fairfield, Ala. T2 .... 5.075
Fairless, Pa. U5 ..... 5.225

Ft.Worth,Tex.(42) T4 .5.525
Gary,Ind. U5 .....5.075
Houston S5 .....5.325
Ind.Harbor,Ind. I-2, Y1 5.075
Johnstown,Pa. B2 ....5.075
Joliet,Ill. P22 .....5.575
KansasCity,Mo. S5 ....5.325
Lackawanna,N.Y. B2 ..5.075
LosAngeles B3 .....5.775
Milton,Pa. M18 .....5.225
Minnequa,Colo. C10 ...5.525
Niles,Calif. P1 .....5.85
Pittsburg,Calif. C11 ..5.775
Pittsburgh J5 .....5.075
Portland,Oreg. O4 .....5.85
SandSprings,Okla. S5 ..5.575
Seattle B3, N14 .....5.825
S.Chicago,Ill. R2 .....5.075
S.Duquesne,Pa. U5 ....5.075
S.SanFrancisco B3 ....5.825
SparrowsPoint,Md. B2 .5.075
Sterling,Ill.(1) N15 ...5.075
Sterling,Ill. N15 .....5.175
Struthers,O. Y1 .....5.075
Torrance,Calif. C11 ...5.775
Youngstown R2, U5 ....5.075

BARS, Reinforcing (Fabricated; to Consumers)

Chicago U8 .....6.81
Cleveland U8 .....6.79
Johnstown,Pa. ¼-1" B2.6.73
KansasCity,Mo. S5 .....7.00
Marion,O. P11 .....6.70
NewYork U8 .....7.20
Pittsburgh J5, U8 .....6.75
Seattle B3, N14 .....7.20
SparrowsPt. ½-1" B2 ..6.73
Williamsport,Pa. S19 ...6.65

RAIL STEEL BARS

ChicagoHts.(3) C2, I-2.5.075
ChicagoHts.(4) I-2 ....5.075
ChicagoHts.(4) C2 .....5.65
Ft.Worth,Tex.(26) T4..5.525
Franklin,Pa.(4) F5 ....5.60
Franklin,Pa.(3) F5 ....5.10
JerseyShore,Pa.(4) J8 ..5.00
Marion,O.(3) P11 .....5.15
Moline,Ill.(3) R2 .....5.225
Tonawanda(3) B12 .....5.65
Tonawanda(4) B12 .....6.15
Williamsport,Pa.(3) S19.5.65

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 12.305
Economy,Pa.(D.R.)B14 15.301
Economy(Staybolt)B14 15.676
McK.Rks.(S.R.) L5 ...13.15
McK.Rks.(D.R.) L5 ...18.00
McK.Rks.(Staybolt) L5.19.15

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

Ala.City,Ala. R2 .....4.675
Allenport,Pa. P7 .....4.675
Ashland,Ky.(8) A10 ..4.675
Cleveland J5, R2 .....4.675
Conshohocken,Pa. A3 ..4.725
Detroit(8) M1 .....4.775
Dravosburg,Pa. U5 ....4.675
Ecorse,Mich. G5 .....4.775
Fairfield,Ala. T2 .....4.675
Fairless,Pa. U5 .....4.725
Fontana,Calif. K1 .....5.525
Gary,Ind. U5 .....4.675
Geneva,Utah C11 .....4.775
GraniteCity,Ill.(8) G4 ..4.875
Ind.Harbor,Ind. I-2, Y1 4.675
Lackawanna,N.Y. B2 ..4.675
Munhall,Pa. U5 .....4.675
Newport,Ky.(8) A2 ...4.675
Niles,O. M21 .....4.675
Pittsburg,Calif. C11 ...5.375
Pittsburgh J5 .....4.675
Portsmouth,O. P12 ....4.675
Riverdale,Ill. A1 .....4.675
Sharon,Pa. S3 .....4.675
S.Chicago,Ill. W14 ....4.675
SparrowsPoint,Md. B2..4.675
Steubenville,O. W10 ...4.675
Warren,O. R2 .....4.675
Weirton,W.Va. W6 ....4.675
Youngstown U5, Y1 ...4.675

SHEETS, H.R. (19 Ga. & Lighter)

Niles,O. M21 .....5.75

SHEETS, H.R. Alloy

Dravosburg,Pa. U5 ....7.75
Gary,Ind. U5 .....7.75
Ind.Harbor,Ind. Y1 .....7.75
Newport,Ky. A2 .....7.75
Youngstown Y1, U5 ....7.75

SHEETS, H.R. (14 Ga. & Heavier) High-Strength Low-Alloy

Cleveland J5, R2 .....6.90
Conshohocken,Pa. A3 ...6.95
Dravosburg,Pa. U5 .....6.90
Ecorse,Mich. G5 .....7.00
Fairfield,Ala. T2 .....6.90
Fairless,Pa. U5 .....6.95
Fontana,Calif. K1 .....7.75
Gary,Ind. U5 .....6.90
Ind.Harbor,Ind. I-2, Y1 6.90
Lackawanna(35) B2 ....6.90
Munhall,Pa. U5 .....6.90
Pittsburgh J5 .....6.90
S.Chicago,Ill. U5 .....6.90
SparrowsPoint(36) B2 ..6.90
Warren,O. R2 .....6.90
Weirton,W.Va. W6 ....6.90
Youngstown U5, Y1 ....6.90

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ...4.925
Cleveland R2 .....5.425
Ind.Harbor,Ind. I-2 ...4.925
Warren,O. R2 .....5.425

SHEETS, Cold-Rolled Steel (Commercial Quality)

Allenport,Pa. P7 .....5.75
Cleveland J5, R2 .....5.75
Conshohocken,Pa. A3 ...5.80
Detroit M1 .....5.75
Dravosburg,Pa. U5 .....5.75
Ecorse,Mich. G5 .....5.85
Fairfield,Ala. T2 .....5.75
Fairless,Pa. U5 .....5.80
Follansbee,W.Va. F4 ...5.75
Fontana,Calif K1 .....7.00
Gary,Ind. U5 .....5.75
GraniteCity,Ill. G4 .....5.95
Ind.Harbor,Ind. I-2, Y1 5.75
Lackawanna,N.Y. B2 ..5.75
Mansfield,O. E6 .....5.75
Middletown,O. A10 .....5.75
Newport,Ky. A2 .....5.75
Pittsburg,Calif. C11 ....6.70
Pittsburgh J5 .....5.75
Portsmouth,O. P12 .....5.75
SparrowsPoint,Md. B2...5.75
Steubenville,O. W10 ....5.75
Warren,O. R2 .....5.75
Weirton,W.Va. W6 ....5.75
Yorkville,O. W10 .....5.75
Youngstown Y1 .....5.75

SHEETS, Cold-Rolled High-Strength, Low-Alloy

Cleveland J5, R2 .....8.525
Dravosburg,Pa. U5 ....8.525
Ecorse,Mich. G5 .....8.625
Fairless,Pa. U5 .....8.575
Fontana,Calif. K1 .....9.775
Gary,Ind. U5 .....8.525
IndianaHarbor,Ind. Y1.8.525
Lackawanna(37) B2 ...8.525
Pittsburgh J5 .....8.525
SparrowsPoint(38) B2 .8.525
Warren,O. R2 .....8.525
Weirton,W.Va. W6 ....8.525
Youngstown Y1 .....8.525

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....6.50
Middletown,O. A10 ....6.25
Warren,O. R2 .....6.50

SHEETS, Culvert	Cu Steel	Cu Fe
Ashland,Ky. A10	6.65	6.90
Canton,O. R2	6.65	7.15
Dravosburg U5	6.65	6.90
Fairfield T2	6.65	6.90
Gary,Ind. U5	6.65	6.90
GraniteCity,Ill.G4	6.85	...
Ind.Harbor I-2	6.65	6.90
Kokomo,Ind. C16	6.75	...
MartinsFry. W10	6.65	...
Pittsburgh J5	6.65	...
Pitts.,Calif. C11	7.40	...
SparrowsPt. B2	6.65	...

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ....6.90
MartinsFry.,O. W10 ....6.90

SHEETS, Galvanized Steel Hot-Dipped

Ala.City,Ala. R2 .....6.30‡
Ashland,Ky. A10 .....6.30†
Canton,O. R2 .....6.30‡
Dover,O. R1 .....6.30†
Dravosburg,Pa. U5 ....6.30†
Fairfield,Ala. T2 .....6.30†
Gary,Ind. U5 .....6.30†
GraniteCity,Ill. G4 ....6.50*
Ind.Harbor,Ind. I-2 ...6.30†
Kokomo,Ind. C16 .....6.40‡
MartinsFerry,O. W10 ..6.30*
Middletown,O. A10 ...6.30†
Pittsburg,Calif. C11 ...7.05*
Pittsburgh J5 .....6.30†
SparrowsPt.,Md. B2 ..6.30†
Warren,O. R2 .....6.30†
Weirton,W.Va. W6 ....6.30*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 .....7.025

SHEETS, Galvanized High-Strength Low-Alloy

Dravosburg,Pa. U5 ...9.275
SparrowsPoint(39) B2..9.275

SHEETS, Galvannealed Steel

Canton,O. R2 .....6.70
Dravosburg,Pa. U5 ....6.70
Kokomo,Ind. C16 .....7.00

SHEETS, Galvanized Ingot Iron (Hot-dipped Continuous)

Ashland,Ky. A10 .....6.55
Middletown,O. A10 .....6.55

SHEETS, Electrogalvanized

Cleveland(28) R2 .....7.125
Niles,O.(28) R2 .....7.125
Weirton,W.Va. W6 ....6.975

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) 8.95
Butler,Pa. A10 (type 2) 9.05

SHEETS, Enameling Iron

Ashland,Ky. A10 .....6.325
Cleveland R2 .....6.325
Dravosburg,Pa. U5 ....6.325
Gary,Ind. U5 .....6.325
GraniteCity,Ill. G4 ....6.525
Ind.Harbor,Ind. I-2, Y1 6.325
Middletown,O. A10 ....6.325
Niles,O. M21 .....6.325
Youngstown Y1 .....6.325

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ...8.35
Ind.Harbor,Ind. I-2 ....8.175
Yorkville,O. W10 .....8.175

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10 6.70
Gary,Ind. U5 .....6.70
Mansfield,O. E6 .....6.70
Middletown,O. A10 .....6.70
Niles,O. M21 .....6.70
Weirton,W.Va. W6 .....6.70

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 .....7.10

Key To Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U.S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div. Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Dearborn Division Sharon Steel Corp.
D4 Disston & Sons, Henry
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 EasternGas&FuelAssoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Div., Jones & Laughlin Steel Corp.
M14 McInnes Steel Co.
M16 Md. Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Division, Merritt-Chapman & Scott
M21 Mallory-Sharon Titanium Corp.

N1 National Standard Co.
N2 National Supply Co.
N3 National Tube Div., U.S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N14 Northwest.SteelRoll.Mill
N15 Northwestern S.&W. Co.
N19 Northeastern Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co. Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reliance Div., Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div. Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service

T2 Tenn.Coal & Iron Div., U.S. Steel Corp.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U.S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U.S. Steel Supply Div., U.S. Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Div., H. K. Porter Co. Inc.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W.Va. Steel & Mfg. Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala. City, Ala. (27) R2	4.675
Allenport, Pa. P7	4.675
Alton, Ill. L1	4.675
Ashland, Ky. (8) A10	4.675
Atlanta A11	4.875
Bessemer, Ala. T2	4.675
Birmingham C15	4.975
Bridgeport, Conn. N19	4.625
Buffalo (27) R2	4.675
Conshohocken, Pa. A3	4.725
Detroit M1	4.775
Ecorse, Mich. G5	4.775
Fairfield, Ala. T2	4.675
Fontana, Calif. K1	5.525
Gary, Ind. U5	4.675
Houston S5	4.925
Ind. Harbor, Ind. I-2, Y1	4.675
Johnstown, Pa. (25) B2	4.675
KansasCity, Mo. S5	4.925
Lackaw'na, N.Y. (25) B2	4.675
LosAngeles (25) B3	5.425
Minnequa, Colo. C10	5.775
Pittsburg, Calif. C11	5.425
Riverdale, Ill. A1	4.675
SanFrancisco S7	5.95
Seattle (25) B3	5.675
Seattle N14	5.675
Sharon, Pa. S3	4.675
S. Chicago, Ill. W14	4.675
S. SanFrancisco (25) B3	5.425
SparrowsPoint, Md. B2	4.675
Sterling, Ill. (1) N15	4.675
Sterling, Ill. N15	4.775
Torrance, Calif. C11	5.425
Warren, O. R2	4.675
Weirton, W.Va. W6	4.675
Youngstown U5	4.675

STRIP, Hot-Rolled Alloy

Bridgeport, Conn. N19	7.50
Carnegie, Pa. S18	7.75
Gary, Ind. U5	7.75
Ind. Harbor, Ind. Y1	7.75
LosAngeles B3	8.95
Newport, Ky. A2	7.75
Sharon, Pa. S3	7.75
S. Chicago, Ill. W14	7.75
Youngstown U5, Y1	7.75

STRIP, Hot-Rolled High-Strength, Low-Alloy

Bessemer, Ala. T2	6.95
Conshohocken, Pa. A3	6.95
Ecorse, Mich. G5	7.05
Fairfield, Ala. T2	6.95
Gary, Ind. U5	6.95
Houston S5	7.20
Ind. Harbor, Ind. I-2, Y1	6.95
KansasCity, Mo. S5	7.20
Lackawanna, N.Y. B2	6.95
LosAngeles (25) B3	7.70
Seattle (25) B3	7.95
Sharon, Pa. S3	6.95
S. SanFrancisco (25) B3	7.70
SparrowsPoint, Md. B2	6.95
Warren, O. R2	6.95
Weirton, W.Va. W6	6.95
Youngstown U5, Y1	6.95

STRIP, Hot-Rolled Ingot Iron

Ashland, Ky. (8) A10	4.925
Warren, O. R2	5.425

STRIP, Cold-Rolled Carbon

Anderson, Ind. G6	6.85
Baltimore T6	6.85
Boston T6	7.40
Buffalo S40	6.85
Cleveland A7, J5	6.85
Conshohocken, Pa. A3	6.90
Dearborn, Mich. D3	6.95
Detroit D2, M1, P20	6.95
Dover, O. G6	6.85
Ecorse, Mich. G5	6.95
Follansbee, W.Va. F4	6.85
Fontana, Calif. K1	8.70
FranklinPark, Ill. T6	6.95
Ind. Harbor, Ind. Y1	6.85
Indianapolis C8	7.00
LosAngeles C1	8.80
NewBedford, Mass. R10	7.30
NewBritain (10) S15	6.85
NewCastle, Pa. B4, E5	6.85
NewHaven, Conn. D2	7.30
NewKensington, Pa. A6	6.85
Pawtucket, R.I. R3	7.50
Pawtucket, R.I. N8	7.40
Pittsburgh J5	6.85
Riverdale, Ill. A1	6.95
Rome, N.Y. (32) R6	6.85
Sharon, Pa. S3	6.85
Trenton, N.J. (31) R5	8.30
Wallingford, Conn. W2	7.30
Warren, O. R2, T5	6.85
Weirton, W.Va. W6	6.85
Worcester, Mass. A7	7.40
Youngstown C8, Y1	6.85

STRIP, Cold-Rolled Alloy

Boston T6	14.90
Carnegie, Pa. S18	14.55
Cleveland A7	14.55
Dover, O. G6	14.55
FranklinPark, Ill. T6	14.55
Harrison, N.J. C18	14.55
Indianapolis C8	14.70
Pawtucket, R.I. N8	14.90
Sharon, Pa. S3	14.55
Worcester, Mass. A7	14.85
Youngstown C8	14.55

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.00
Dearborn, Mich. D3	10.10
Dover, O. G6	10.10
Ecorse, Mich. G5	10.10
Ind. Harbor, Ind. Y1	10.20
Sharon, Pa. S3	10.00
Warren, O. R2	10.00
Weirton, W.Va. W6	10.20
Youngstown Y1	10.20

STRIP, Cold-Rolled Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	8.50	10.10	12.30	15.30	18.25
Boston T6	8.50	10.10	12.30	15.30	18.25
Bristol, Conn. W1	...	...	12.30	15.30	18.25
Carnegie, Pa. S18	...	9.80	12.00	15.00	....
Cleveland A7	7.95	9.80	12.00	15.00	17.95
Cleveland C7	..	9.80	12.00	15.00	17.95
Dover, O. G6	7.95	9.80	12.00	15.00	17.95
Detroit D2	8.05	9.90	12.10	15.10	....
Dearborn, Mich. D3	8.05	9.30	12.10	....	....
FranklinPark, Ill. T6	8.05	9.80	12.00	15.00	17.95
Harrison, N.J. C18	...	...	12.30	15.30	18.25
Indianapolis C8	8.10	9.95	12.00	15.00	17.95
NewBritain, Conn. (10) S15	7.95	9.80	12.00	15.00	17.95
NewCastle, Pa. B4, E5	7.95	9.80	12.00	15.00	....
NewHaven, Conn. D2	8.40	10.10	12.30	15.30	....
NewKensington, Pa. A6	7.95	9.80	12.00	15.00	....
NewYork W3	...	10.10	12.30	15.30	18.25
Pawtucket, R.I. N8	8.50	10.10	12.30	15.30	18.25
Riverdale, Ill. A1	8.05	9.80	12.00	15.00	17.95
Rome, N.Y. (32) R6	7.95	9.80	12.00	15.00	17.95
Sharon, Pa. S3	7.95	9.80	12.00	15.00	17.95
Trenton, N.J. R5	...	10.10	12.30	15.30	18.25
Wallingford, Conn. W2	8.40	10.10	12.30	15.30	18.15
Warren, O. T5	7.95	9.80	12.00	15.00	17.95
Weirton, W.Va. W6	7.95	9.80	12.00	15.00	17.95
Worcester, Mass. A7, T6	8.50	10.10	12.30	15.30	18.25
Youngstown C8	7.95	9.80	12.00	15.00	17.95

STRIP, Cold-Rolled Spring Steel (Tempered)

	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol, Conn. W1	16.80	20.65	....
Buffalo W12	16.80	....	....
FranklinPark, Ill. T6	17.15	21.00	25.35
Harrison, N.J. C18	16.80	20.65	25.00
NewYork W3	16.80	20.65	25.00
Palmer, Mass. W12	16.80	....	....
Trenton, N.J. R5	16.80	20.65	25.00
Worcester, Mass. A7, T6	16.80	20.65	25.00
Youngstown C8	17.15	21.00	25.35

STRIP, Galvanized (Continuous)

Sharon, Pa. S3	6.975

TIGHT COOPERAGE HOOP

Atlanta A11	5.40
Riverdale, Ill. A1	5.25
Sharon, Pa. S3	5.10
Youngstown U5	5.10

STRIP, Cold-Rolled Ingot Iron

Warren, O. R2	7.60

STRIP, C.R. Electrogalvanized

Cleveland A7	6.85*
Dover, O. G6	6.85*
Riverdale, Ill. A1	6.95*
Warren, O. B9, T5	6.85*
Worcester, Mass. A7	7.40*
Youngstown C8	6.85*

*Plus galvanizing extras.

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
Brackenridge, Pa. A4	...	....	11.525	12.575	13.55
GraniteCity, Ill. G4	9.40*	10.55*	11.225*	12.275*	....
IndianaHarbor, Ind. I-2	9.20†	10.35*	11.025*	12.075*	....
Mansfield, O. E6	9.70	10.85	11.525	12.575	13.55
Vandergrift, Pa. U5	9.20*	10.35*	11.025*	12.075*	13.05*
Vandergrift, Pa. U5	....	10.85†	11.525†	12.575†	13.55†
Warren, O. R2	9.20*	10.85	11.525	12.575	13.55

H.R. SHEETS (22 Ga., cut lengths)	Transformer Grades T-72	T-65	T-58	T-52
BeechBottom, W.Va. W10	14.05	14.60	15.10	16.15
Brackenridge, Pa. A4	14.05	....	....	....
Vandergrift, Pa. U5	14.05	14.60	15.10	16.15
Zanesville, O. A10	14.05	14.60	15.10	16.15

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge, Pa. A4	....	16.90	18.50	19.00	19.50	14.05**
Butler, Pa. A10	....	....	18.50	19.00	19.50	....
Vandergrift, Pa. U5	15.90	16.90	18.50	19.00	19.50	14.55**
Warren, O. R2	....	....	....	....	....	14.55‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. **Cut lengths, ¾-cent lower.

SILICON STEEL

H.R. SHEETS (22 Ga., cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom, W.Va. W10	...	...	11.00	12.05	13.05
Brackenridge, Pa. A4	...	...	11.00	12.50	13.05
Mansfield, O. E6	9.20	10.35	11.00	12.05	13.05
Newport, Ky. A2	9.20	10.35	11.00	12.05	13.05
Niles, O. M21	9.20	10.35	11.00	12.05	....
Vandergrift, Pa. U5	...	10.35	11.00	12.05	13.05
Warren, O. R2	9.20	10.35	11.00	12.05	....
Zanesville, O. A10	...	10.35	11.00	12.05	13.05
Zanesville, O. A10 (FP coils)	...	10.85	11.525	12.575	13.55
Zanesville, O. A10 (SP coils)	...	....	11.025	12.075	13.05

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa, Pa. J5	$8.40	$8.65	$9.05
Dravosburg, Pa. U5	8.40	8.65	9.05
Fairfield, Ala. T2	8.50	8.75	9.15
Fairless, Pa. U5	8.50	8.75	9.15
Fontana, Calif. K1	9.15	9.40	9.80
Gary, Ind. U5	8.40	8.65	9.05
GraniteCity, Ill. G4	8.50	8.75	9.15
IndianaHarbor, Ind. I-2, Y1	8.40	8.65	9.05
Niles, O. R2	8.40	8.65	9.05
Pittsburg, Calif. C11	9.15	9.40	9.80
SparrowsPoint, Md. B2	8.50	8.75	9.15
Weirton, W.Va. W6	8.40	8.65	9.05
Yorkville, O. W10	8.40	8.65	9.05

ELECTROTIN (22-27 Gage; Dollars per 100 lb)			
Aliquippa, Pa. J5	7.425	7.625	....
Niles, O. R2	7.425	7.625	7.925

TINPLATE, American	1.25 lb	1.50 lb
Aliquippa, Pa. J5	$9.70	$9.95
Dravosburg, Pa. U5	9.70	9.95
Fairfield, Ala. T2	9.80	10.05
Fairless, Pa. U5	9.80	10.05
Fontana, Calif. K1	10.45	10.70
Gary, Ind. U5	9.70	9.95
Pitts., Calif. C11	10.45	10.70
Sp. Pt., Md. B2	9.80	10.05
Weirton, W.Va. W6	9.70	9.95
Yorkville, O. W10	9.70	9.95

BLACK PLATE (Base Box)	
Aliquippa, Pa. J5	$7.50
Dravosburg, Pa. U5	7.50
Fairfield, Ala. T2	7.60
Fairless, Pa. U5	7.60
Fontana, Calif. K1	8.25
Gary, Ind. U5	7.50
GraniteCity, Ill. G4	7.60
Ind. Harbor, Ind. I-2, Y1	7.50
Niles, O. R2	7.50
Pittsburg, Calif. C11	8.25
SparrowsPoint, Md. B2	7.60
Weirton, W.Va. W6	7.50
Yorkville, O. W10	7.50

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa, Pa. J5	$7.15
Dravosburg, Pa. U5	7.15
Gary, Ind. U5	7.15
GraniteCity, Ill. G4	7.25
Ind. Harbor, Ind. Y1	7.15
Yorkville, O. W10	7.15

MANUFACTURING TERNES (Special Coated; Base Box)

Dravosburg, Pa. U5	$9.20
Gary, Ind. U5	9.20

ROOFING SHORT TERNES (8 lb Coated; Base Box)

Gary, Ind. U5	$10.75

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity, Ala. R2	7.20
Aliquippa, Pa. J5	7.20
Alton, Ill. L1	7.40
Atlanta A11	7.40
Bartonville, Ill. K4	7.30
Buffalo W12	7.20
Chicago W13	7.20
Cleveland A7, C20	7.20
Crawfordsville, Ind. M8	7.30
Donora, Pa. A7	7.20
Duluth A7	7.20
Fairfield, Ala. T2	7.20
Fostoria, O. (24) S1	7.30
Houston S5	7.45
Jacksonville, Fla. M8	7.55
Johnstown, Pa. B2	7.20
Joliet, Ill. A7	7.20
KansasCity, Mo. S5	7.45
Kokomo, Ind. C16	7.30
LosAngeles B3	8.15
Minnequa, Colo. C10	7.45
Monessen, Pa. P7, P16	7.20
N. Tonawanda, N.Y. B11	7.20
Palmer, Mass. W12	7.50
Pittsburg, Calif. C11	8.15
Portsmouth, O. P12	7.20
Rankin, Pa. A7	7.20
S. Chicago, Ill. R2	7.20
S. SanFrancisco C10	8.15
SparrowsPoint, Md. B2	7.30
Sterling, Ill. (1) N15	7.20
Sterling, Ill. N15	7.30
Struthers, O. Y1	7.20
Waukegan, Ill. A7	7.20
Worcester, Mass. A7	7.50

WIRE, Gal'd ACSR for Cores

Bartonville, Ill. K4	11.75
Buffalo W12	11.75
Cleveland A7	11.75
Donora, Pa. A7	11.75
Duluth A7	11.75
Johnstown, Pa. B2	11.75
Minnequa, Colo. C10	11.875
Monessen, Pa. P16	11.75
Muncie, Ind. I-7	11.95
NewHaven, Conn. A7	12.05
Palmer, Mass. W12	12.05
Pittsburg, Calif. C11	12.55
Portsmouth, O. P12	11.75
Roebling, N.J. R5	12.05
SparrowsPt., Md. B2	11.85
Struthers, O. Y1	11.75
Trenton, N.J. A7	12.05
Waukegan, Ill. A7	11.75
Worcester, Mass. A7	12.05

ROPE WIRE (A)

Bartonville, Ill. K4	11.55
Buffalo W12	11.55
Fostoria, O. S1	11.55
Johnstown, Pa. B2	11.55
Monessen, Pa. P7, P16	11.55
Muncie, Ind. I-7	11.75
Palmer, Mass. W12	11.85
Portsmouth, O. P12	11.55
Roebling, N.J. R5	11.85
SparrowsPt., Md. B2	11.65
Struthers, O. Y1	11.55
Worcester, Mass. J4	11.85

(A) Plow and Mild Plow; add 0.25c for Improved Plow

WIRE, Upholstery Spring

Aliquippa, Pa. J5	8.40
Alton, Ill. L1	8.60
Buffalo W12	8.40
Cleveland A7	8.40
Donora, Pa. A7	8.40
Duluth A7	8.40
Johnstown, Pa. B2	8.40
KansasCity, Mo. S5	8.65
LosAngeles B3	9.35
Minnequa, Colo. C10	8.60
Monessen, Pa. P7, P16	8.40
NewHaven, Conn. A7	8.70
Palmer, Mass. W12	8.70
Pittsburg, Calif. C11	9.35
Portsmouth, O. P12	8.40
Roebling, N.J. R5	8.70
S. Chicago, Ill. R2	8.40
S. SanFrancisco C10	9.35
SparrowsPoint, Md. B2	8.50
Struthers, O. Y1	8.40
Trenton, N.J. A7	8.70
Waukegan, Ill. A7	8.40
Worcester, Mass. A7	8.70

WIRE, MB Spring, High Carbon

Aliquippa, Pa. J5	8.725
Alton, Ill. L1	8.925
Bartonville, Ill. K4	8.925
Buffalo W12	8.725
Cleveland A7	8.725
Donora, Pa. A7	8.725
Duluth A7	8.725
Fostoria, O. S1	8.775
Johnstown, Pa. B2	8.725
LosAngeles B3	9.675
Milbury, Mass. (12) N6	9.025
Minnequa, Colo. C10	8.975
Monessen, Pa. P7, P16	8.725
Muncie, Ind. I-7	8.925
Palmer, Mass. W12	9.025
Pittsburg, Calif. C11	9.675
Portsmouth, O. P12	8.725
Roebling, N.J. R5	9.025
S. Chicago, Ill. R2	8.725
S. SanFrancisco C10	9.675
SparrowsPt., Md. B2	8.825
Struthers, O. Y1	8.725
Trenton, N.J. A7	9.025
Waukegan, Ill. A7	8.725
Worcester A7, J4, T6	9.025

WIRE, Fine & Weaving (8" Coils)

Alton, Ill. L1	14.35
Bartonville, Ill. K4	14.25
Buffalo W12	14.15
Chicago W13	14.15
Cleveland A7	14.15
Crawfordsville, Ind. M8	14.25
Fostoria, O. S1	14.15
Jacksonville, Fla. M8	14.50
Johnstown, Pa. B2	14.15
Kokomo, Ind. C16	14.15
Minnequa, Colo. C10	13.90
Monessen, Pa. P6	14.15
Muncie, Ind. I-7	14.35
Palmer, Mass. W12	14.45
S. SanFrancisco C10	14.50
Waukegan, Ill. A7	14.15
Worcester, Mass. A7, T6	14.45

WIRE

WIRE, Tire Bead

Bartonville,Ill. K4	15.25
Monessen,Pa. P16	15.45
Roebling,N.J. R5	15.60

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	10.75
Baltimore T6	11.05
Boston T6	11.05
Buffalo W12	10.75
Cleveland A7	10.75
Crawfordsville,Ind. M8	10.75
Dover,O. G6	10.75
Fostoria,O. S1	10.75
FranklinPark,Ill. T6	10.85
Kokomo,Ind. C16	10.75
Massillon,O. R8	10.75
Milwaukee C23	10.95
Monessen,Pa. P7, P16	10.75
NewKensington,Pa. A6	10.75
Palmer,Mass. W12	11.05
Pawtucket,R.I. N8	11.05
Riverdale,Ill. A1	10.85
Rome,N.Y. R6	10.75
Trenton,N.J. R5	11.05
Worcester,Mass. A7, T6	11.05

NAILS & POLISHED STAPLES,

Stock	Col.
AlabamaCity,Ala. R2	.164
Aliquippa,Pa. J5	.164
Atlanta A11	.166
Bartonville,Ill. (7) K4	.169
Crawfordsville,Ind. M8	.166
Donora,Pa. A7	.164
Duluth A7	.164
Fairfield,Ala. T2	.164
Houston,Tex. S5	.169
Jack'ville,Fla. (20) M8	.175
Johnstown,Pa. B2	.164
Joliet,Ill. A7	.164
KansasCity,Mo. S5	.169
Kokomo,Ind. C16	.166
Minnequa,Colo. C10	.169
Monessen,Pa. (7) P7	.167
Pittsburg,Calif. C11	.183
Rankin,Pa. A7	.164
S.Chicago,Ill. R2	.164
SparrowsPt.,Md. B2	.166
Sterling,Ill. (1) N15	.164
Worcester,Mass. A7	.170

NAILS, Stock — **Col.**

Chicago (7) W13	.164
Cleveland (7) A9	.170

(To Wholesalers; per cwt)

Galveston,Tex. D7	$8.75

NAILS, Cut (100 lb keg)
To Dealers (33)

Conshohocken,Pa. A3	$9.80
Wheeling,W.Va. W10	9.80

TIE WIRE, Automatic Baler (14½ Ga.)(Per 97 lb Net Box)
Coil No. 3150

AlabamaCity,Ala. R2	$9.53
Atlanta A11	9.63
Bartonville,Ill. K4	10.13
Buffalo W12	10.05
Chicago W13	9.53
Crawfordsville,Ind. M8	9.63
Donora,Pa. A7	9.53
Duluth A7	9.53
Fairfield,Ala. T2	9.53
Houston S5	9.78
Jack'ville,Fla. M8	10.09
Johnstown,Pa. B2	9.53
Joliet,Ill. A7	9.53
KansasCity,Mo. S5	9.78
Kokomo,Ind. C16	9.63
LosAngeles B3	10.32
Minnequa,Colo. C10	9.78
Pittsburg,Calif. C11	10.31
S.Chicago,Ill. R2	9.53
S.SanFrancisco C10	10.31
SparrowsPt.,Md. B2	9.63
Sterling,Ill.(1) N15	9.53

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$9.85
Atlanta A11	9.95
Bartonville,Ill. K4	10.45
Buffalo W12	10.35
Chicago W13	9.85
Crawfordsville,Ind. M8	9.95
Donora,Pa. A7	9.85
Duluth A7	9.85
Fairfield,Ala. T2	9.85
Houston S5	10.10
Kokomo,Ind. C16	9.95
Jacksonville,Fla. M8	10.41
Johnstown,Pa. B2	9.85
Joliet,Ill. A7	9.85
KansasCity,Mo. S5	10.10
Kokomo,Ind. C16	10.45
LosAngeles B3	10.65
Minnequa,Colo. C10	10.10
Pittsburg,Calif. C11	10.65
S.Chicago,Ill. R2	9.85
S.SanFrancisco C10	10.65
SparrowsPt.,Md. B2	9.95
Sterling,Ill.(1) N15	9.85

Coil Interim

AlabamaCity,Ala. R2	$9.90
Atlanta A11	10.00
Bartonville,Ill. K4	10.50
Buffalo W12	10.40
Chicago W13	9.90
Crawfordsville,Ind. M8	10.00
Donora,Pa. A7	9.90
Duluth A7	9.90
Fairfield,Ala. T2	9.91
Houston S5	10.15
Jacksonville,Fla. M8	10.46
Johnstown,Pa. B2	9.90
Joliet,Ill. A7	9.90
KansasCity,Mo. S5	10.15
Kokomo,Ind. C16	10.00
LosAngeles B3	10.70
Minnequa,Colo. C10	10.15
Pittsburg,Calif. C11	10.70
S.Chicago,Ill. R2	9.90
S.SanFrancisco C10	10.70
SparrowsPt.,Md. B2	10.00
Sterling,Ill.(1) N15	9.90

WIRE, Barbed — **Col.**

AlabamaCity,Ala. R2	.184**
Aliquippa,Pa. J5	.181§
Atlanta A11	.190*
Bartonville,Ill. K4	.193
Crawfordsville,Ind. M8	.190
Donora,Pa. A7	.184†
Duluth A7	.184†
Fairfield,Ala. T2	.184†
Houston,Tex. S5	.189**
Jacksonville,Fla. M8	.195
Johnstown,Pa. B2	.188*
Joliet,Ill. A7	.184†
KansasCity,Mo. S5	.189**
Kokomo,Ind. C16	.186†
Minnequa,Colo. C10	.189**
Monessen,Pa. P7	.191*
Pittsburg,Calif. C11	.204†
Rankin,Pa. A7	.184†
S.Chicago,Ill. R2	.184**
S.SanFrancisco C10	.207**
SparrowsPoint,Md. B2	190*
Sterling,Ill.(1) N15	.188*

WOVEN FENCE, 9-15 Ga. — **Col.**

Ala.City,Ala. R2	.176**
Aliq'ppa,Pa. 9-14½ga.J5	179§
Atlanta A11	.182*
Bartonville,Ill. K4	.187
Crawfordsville,Ind. M8	.182
Donora,Pa. A7	.176†
Duluth A7	.176†
Fairfield,Ala. T2	.176†
Houston,Tex. S5	.181**
Jacksonville,Fla. M8	.187
Johnstown,Pa.(43) B2	.180*
Joliet,Ill. A7	.176†
KansasCity,Mo. S5	.181**
Kokomo,Ind. C16	.178†
Minnequa,Colo. C10	.181**
Monessen,Pa. 9 ga. P7	185*
Pittsburg,Calif. C11	.199†
Rankin,Pa. A7	.176†
S.Chicago,Ill. R2	.176**
Sterling,Ill.(1) N15	.180*

WIRE (16 gage)	Stone	An'ld Galv. Stone
Ala.City,Ala.R2	15.70	17.25**
Aliq'ppa,Pa. J5	15.70	17.50
Bartonville K4	16.10	18.05
Buffalo W12	16.10	....
Cleveland A7	15.70	....
Crawf'dsville M8	15.80	17.75
Fostoria,O. S1	16.20	17.75†
Houston S5	15.95	17.50**
Jacksonville M8	16.05	18.00
Johnstown B2	16.10	18.05*
Kan.City,Mo.S5	15.95	17.50**
Kokomo C16	15.80	17.35†
Minnequa C10	16.05	17.75**
P'lm'r,Mass.W2	16.10	17.65*
Pitts.,Calif. C11	16.05	17.60†
SparrowsPt. B2	16.20	18.15*
Sterling(1) N15	16.10	18.05*
Waukegan A7	15.70	17.25†
Worcester A7	16.00	....

WIRE, Merchant Quality (6 to 8 gage)	An'ld Galv.
Ala.City,Ala. R2	7.95 8.35**
Aliquippa J5	7.95 8.475§
Atlanta A11	8.05 8.65*
Bartonville(48) K4	8.20 8.80
Buffalo W12	8.10 8.50†
Cleveland A7	7.95 ....
Crawfordsville M8	8.05 8.65
Donora,Pa. A7	7.95 8.35†
Duluth A7	7.95 8.35†
Fairfield T2	7.95 8.35†
Houston(48) S5	8.20 8.60**
Jacks'ville,Fla. M8	8.30 8.90
Johnstown B2(48)	7.95 8.55*
Joliet,Ill. A7	7.95 8.35†
Kans.City(48) S5	8.20 8.60**
Kokomo C16	8.05 8.45†
LosAngeles B3	8.90 9.50*
Minnequa, C10	8.20 8.60**
Monessen P7 (48)	8.10 8.70*
Palmer,Mass. W12	8.40 8.80†
Pitts.,Calif. C11	8.90 9.30†
Portsmouth,O. P12	7.95 ....
Rankin,Pa. A7	7.95 8.35†
S.Chicago R2	7.95 8.35**
S.SanFran. C10	8.90 9.30**
Spar'wsPt. B2(48)	8.05 8.65*
Sterling(1)(48)N15	7.95 8.55*
Struth'rs,O.(48)Y1	7.95 8.45‡
Worcester,Mass.A7	8.25 8.65†

Based on zinc price of: *13.50c. †5c. §10c. ‡Less than 10. ††13c. **Subject to zinc equalization extras.

BALE TIES, Single Loop — **Col.**

AlabamaCity,Ala. R2	.190
Atlanta A11	.192
Bartonville,Ill. K4	.197
Crawfordsville,Ind. M8	.192
Donora,Pa. A7	.190
Duluth A7	.190
Fairfield,Ala. T2	.190
Houston S5	.195
Jacksonville,Fla. M8	.197
Joliet,Ill. A7	.190
KansasCity,Mo. S5	.195
Kokomo,Ind. C16	.192
Minnequa,Colo. C10	.195
Pitts.,Calif. C11	.214
S.Chicago,Ill. R2	.190
S.SanFrancisco C10	.214
Sterling,Ill. N15	.190
SparrowsPoint,Md. B2	.192
Tonawanda,N.Y. B12	.169
Williamsport,Pa. S19	.175

FENCE POSTS

ChicagoHts.,Ill. C2, I-2	.167
Duluth A7	.167
Franklin,Pa. F5	.167
Huntington,W.Va. W7	.169
Johnstown,Pa. B2	.167
Marion,O. P11	.167
Minnequa,Colo. C10	.172
Sterling,Ill. N15	.167
Tonawanda,N.Y. B12	.169
Williamsport,Pa. S19	.175

FASTENERS

(Base discounts, full container quantity, per cent off list, f.o.b. mill)

BOLTS

Carriage, Machine Bolts

Full Size Body (cut thread)
½ in. and smaller;
6 in. and shorter.. 55
Longer than 6 in. .. 46.5
⅝ in. thru 1 in.:
6 in. and shorter .. 46.5
Longer than 6 in. .. 44
1⅛ in. and larger:
All lengths 44
Undersized Body (rolled thread)
½ in. and smaler:
6 in. and shorter .. 55

Carriage, Machine, Lag Bolts Hot Galvanized:

½ in. and smaller:
6 in. and shorter .. 35
Longer than 6 in. .. 23
⅝ in. thru 1 in.:
6 in. and shorter .. 20
Longer than 6 in. .. 20
1⅛ in. and larger:
All lengths 20

Lag Bolts

All diameters:
6 in. and shorter 55
Longer than 6 in. .. 47

Plow and Tap Bolts

½ in. and smaller by 6 in. and shorter 54
Larger than ½ in. or longer than 6 in. 47

Blank Bolts 47

Step, Elevator, Tire Bolts 54

NUTS

Reg. & Heavy Square Nuts:
All sizes 59

Square Nuts, Reg. & Heavy, Hot Galvanized:
All sizes 45

Hex Nuts, Reg. & Heavy, Hot Pressed:

¾ in. and smaller .	63
⅞ in. to 1 in., incl.	59.5
1⅛ in. to 1½ in., incl.	64
1⅝ in. and larger ..	58

Hex Nuts, Reg. & Heavy, Cold Punched:

¾ in. and smaller..	63
⅞ in. to 1 in., incl.	59.5
1⅛ in. and larger .	58

Hex Nuts, All Types, Hot Galvanized:

¾ in. and smaller..	50
⅞ in. to 1 in., incl.	46
1⅛ in. to 1½ in., incl.	51

Hex Nuts, Semifinished, Reg. & Heavy (Incl. Slotted):

¾ in. and smaller..	63
⅞ in. to 1½ in., incl.	59.5
1⅝ in. and larger ..	58

Hex Nuts, Finished (Incl. Slotted and Castellated):

1 in. and smaller ..	65
1⅛ in. to 1½ in., incl.	62
1⅝ in. and larger..	58

CAP AND SET SCREWS

(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Cap Screws, Coarse or Fine Thread, Bright:

6 in. and shorter:

¼ in. and smaller..	47
⅝, ¾ and 1 in. diam.	31

Longer than 6 in.:

¼ in. and smaller..	18.5
⅝, ¾ and 1 in. diam.	5.5

High Carbon, Heat Treated:

6 in. and shorter:

¼ in. and smaller..	34
⅝, ¾ and 1 in. diam.	13

Longer than 6 in.:

¼ in. and smaller	+1
⅝, ¾ and 1 in. diam.	+19

Fillister Head, Coarse Thread:
Listed Sizes ..... +31

Flat Head, Coarse Thread:
¼ in. and smaller by 6 in. and shorter..+57

Set Screws, Square Head, Cup Point, Coarse Thread:
Through 1 in. diam.:
6 in. and shorter .. 11
Longer than 6 in. ..+10

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 10.85
⅞-in. under List less 26.5%

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	23.56	22.84
1¼	13	....	27.92	22.68
1½	13	26.34	30.86	25.08
1¾	13	31.12	36.45	29.64
2	13	34.88	40.85	33.21
2¼	13	39.29	46.01	37.42
2½	12	42.64	49.94	40.61
2½	12	46.98	55.01	44.73
2¾	12	50.86	59.57	48.44
3	12	54.24	63.53	51.66

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Standard All	Toe Rails 60 lb Under
RAILS				
Bessemer,Pa. U5	5.075	4.975	5.025	6.00
Ensley,Ala. T2	5.075	4.975	....	6.00
Fairfield, Ala. T2	....	....	....	6.00
Gary,Ind. U5	5.075	4.975	5.025	....
Huntington,W.Va. W7	....	....	....	6.15
IndianaHarbor,Ind. I-2	5.075	4.975	5.025	....
Johnstown,Pa. B2	....	....	...(16)	6.00
Lackawanna,N.Y. B2	5.075	4.975	...(16)	6.00
Minnequa,Colo. C10	5.075	4.975	....	6.50
Steelton,Pa. B2	5.075	4.975	....	....
Williamsport,Pa. S19	....	....	....	6.15

TIE PLATES

Fairfield,Ala. T2	6.025
Gary,Ind. U5	6.025
Ind.Harbor,Ind. I-2	6.025
Lackawanna,N.Y. B2	6.025
Minnequa,Colo. C10	6.025
Seattle B3	6.175
Steelton,Pa. B2	6.025
Torrance,Calif. C11	6.175

JOINT BARS

Bessmer,Pa. U5	6.35
Fairfield,Ala. T2	6.35
Ind.Harbor,Ind. I-2	6.35
Joliet,Ill. U5	6.35
Lackawanna,N.Y. B2	6.35
Minnequa,Colo. C10	6.35
Steelton,Pa. B2	6.35

AXLES

Ind.Harbor,Ind. S13	8.10
Johnstown,Pa. B2	8.10

TRACK BOLTS, Untreated

Cleveland R2	13.10
Lebanon,Pa. B2	13.10
Minnequa,Colo. C10	13.10
Pittsburgh P14	13.10
Seattle B3	13.60

SCREW SPIKES

Cleveland R2	12.85
Pittsburgh P14	12.85

STANDARD TRACK SPIKES

Fairfield,Ala. T2	8.775
Ind.Harbor,Ind. I-2, Y1	8.775
KansasCity,Mo. S5	8.775
Lebanon,Pa. B2	8.775
Minnequa,Colo. C10	8.775
Pittsburgh J5	8.775
Seattle B3	9.275
S.Chicago,Ill. R2	8.775
Struthers,O. Y1	8.775
Youngstown R2	8.775

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.; 1 7/16 to under 1 5/16 in.; 6.25c; 1 15/16 to 8 in.; inclusive, 6.60c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ¾" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) Plus 1c per 100 lb.
(21) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Delivered in mill zone, 5.685c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝-in.; 7.30c, for widths ⅝-in and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.685c.
(43) 9-14½ Ga.
(48) 6-7 Ga.
(49) 3½in. and smaller rounds; 8.65c, over 3½-in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft.	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+2	+20	4.5	+14.25	7	+11.75	8.5	+10.25	8.5	+10.25	8.25	+10.5	10.75	+8
Ambridge, Pa. N2	+2	....	4.5	....	7	....	8.5	....	8.5	....	8.25	....	10.75	....
Lorain, O. N3	+2	+20	4.5	+14.25	7	+11.75	8.5	+10.25	8.5	+10.25	8.25	+10.5	10.75	+8
Youngstown Y1	0.5	+17.5	4.5	+14.25	7	+11.75	8.5	+10.25	8.5	+10.25	8.25	+10.5	10.75	+8

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+2	+20	4.5	+14.25	7	+11.75	8.5	+10.25	8.5	+10.25	8.25	+10.5	10.75	+8

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	12.5	+6.75	15.5	+2.75	18	0.75	20.5	2.5
Alton, Ill. L1	....	....	....	....	....	....	10.5	+3.75	13.5	+4.75	16	+1.25	18.5	0.5
Benwood, W. Va. W10	10	+20.5	+0.25	+27.75	+9.75	+37.25	12.5	+6.75	15.5	+2.75	18	0.75	20.5	2.5
Butler, Pa. F6	10	+20.5	0.5	+27	+8.5	+36	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	12.5	+6.75	15.5	+2.75	18	0.75	20.5	2.5
Fairless, Pa. N3	....	....	....	....	....	....	10.5	+8.75	13.5	+4.75	16	+1.25	18.5	0.5
Fontana, Calif. K1	....	....	....	....	....	....	+0.5	+19.75	2.5	+15.75	5	+12.5	7.5	+10.5
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	11.5	+7.75	14.5	+3.75	17	+0.25	19.5	1.5
Lorain, O. N3	....	....	....	....	....	....	12.5	+6.75	15.5	+2.75	18	0.75	20.5	2.5
Sharon, Pa. S4	11	+19.5	1.5	+26	+7.5	+35	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	12.5	+6.75	15.5	+2.75	18	0.75	20.5	2.5
Sparrows Pt., Md. B2	9	+21.5	0.5	+28	+9.5	+37	10.5	+8.75	13.5	+4.75	16	+1.25	18.5	0.5
Wheatland, Pa. W9	11	+19.5	1.5	+26	+7.5	+35	12.5	+6.75	15.5	+2.75	18	0.75	20.5	2.5
Youngstown R2, Y1	....	....	....	....	....	....	12.5	+6.75	15.5	+2.75	18	0.75	20.5	2.5

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	21	3.5	21.5	4	23	4.75	23	4.75	....	....	....	....
Alton, Ill. L1	19	1.5	19.5	2	21	2.75	21	2.75	....	....	....	....
Benwood, W. Va. W10	21	3.5	21.5	4	23	4.75	23	4.75	13.5	+0.75	13.5	+5.25
Etna, Pa. N2	21	3.5	21.5	4	23	4.75	23	4.75	13.5	+5.25	13.5	+5.25
Fairless, Pa. N3	19	1.5	19.5	2	21	2.75	21	2.75	11.5	+7.25	11.5	+7.25
Fontana, Calif. K1	8	+9.5	8.5	+9	10	+8.25	10	+8.25	0.5	+18.25	0.5	+18.25
Indiana Harbor, Ind. Y1	20	2.5	20.5	3	22	3.75	22	3.75	12.5	+6.25	12.5	+6.25
Lorain, O. N3	21	3.5	21.5	4	23	4.75	23	4.75	....	....	....	....
Sharon, Pa. M6	21	3.5	21.5	4	23	4.75	23	4.75	....	....	....	....
Sparrows Pt., Md. B2	19	1.5	19.5	2	21	2.75	21	2.75	11	+7.25	11	+7.25
Wheatland, Pa. W9	21	3.5	21.5	4	23	4.75	23	4.75	13.5	+5.25	13.5	+5.25
Youngstown R2, Y1	21	3.5	21.5	4	23	4.75	23	4.75	13.5	+5.25	13.5	+5.25

*Galvanized pipe discounts based on current price of zinc (13.50c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	Wire Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	21.25	26.00	....	34.50	....	....	....	46.75	43.25
202	22.75	29.00	35.00	37.50	39.25	41.25	43.25	47.25	47.25
301	22.25	27.00	35.75	35.75	40.25	42.50	44.50	49.25	45.75
302	24.25	30.25	36.50	39.00	41.00	43.25	45.50	50.00	50.00
302B	24.50	31.50	39.25	44.00	43.25	45.50	47.50	54.75	54.75
303	....	30.75	39.50	....	44.00	46.25	48.00	54.50	54.50
304	26.00	32.00	39.00	42.50	43.75	46.00	48.75	53.25	53.25
304L	....	....	46.50	49.50	51.25	53.50	56.25	60.75	60.75
305	27.50	35.25	40.75	45.75	43.75	46.00	49.25	56.50	56.50
308	29.50	36.75	45.50	48.25	50.75	53.50	58.00	60.50	60.50
309	38.25	47.50	55.50	62.00	61.25	64.50	68.25	77.50	77.50
310	47.75	59.25	75.00	81.00	83.25	87.50	89.25	93.00	93.00
314	....	....	....	....	83.25	....	80.25	....	100.50
316	38.25	47.50	59.75	66.50	66.75	70.25	73.75	78.25	78.25
316L	....	....	67.25	73.00	74.25	77.25	81.25	85.75	85.75
317	46.25	57.75	73.75	84.75	83.00	87.25	90.00	97.00	97.00
321	31.00	38.50	45.25	51.50	50.50	53.25	57.50	63.00	63.00
18-8 CbTa.	35.50	44.75	53.50	61.00	59.25	62.25	67.00	76.25	76.25
403	....	....	30.75	....	34.50	36.25	38.75	46.50	46.50
405	18.75	24.50	28.50	34.50	32.50	34.00	36.00	45.00	45.00
410	16.00	20.75	27.25	29.75	31.00	32.50	33.75	38.75	38.75
416	....	....	27.75	....	31.50	33.00	34.75	46.50	46.50
420	....	32.25	33.00	40.25	37.75	39.75	43.50	59.50	59.50
430	16.25	21.00	27.75	30.75	31.50	33.00	34.50	39.25	39.25
430F	....	....	28.25	....	32.00	33.50	35.25	49.75	49.75
431	....	27.75	36.25	....	40.25	42.50	44.25	53.75	53.75
446	....	....	37.75	56.75	42.50	44.75	46.00	67.25	67.25

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Div., H. K. Porter Co. Inc.; Alloy Tube Div., Carpenter Steel Co.; American Steel & Wire Div., U.S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Elwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McInnes Steel Co.; McLouth Steel Corp.; Metal Forming Corp.; National-Standard Co.; National Tube Div., U.S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

	Plates 5%	Plates Carbon Base 10%	Plates Carbon Base 15%	Plates Carbon Base 20%	Sheets Carbon Base 20%
Stainless					
302	....	....	....	....	35.50
304	33.15	36.20	40.30	44.50	37.75
304-L	35.40	38.80	43.15	47.65	....
316	38.35	41.60	45.90	50.15	55.50
316-L	43.55	47.60	52.70	57.85	....
316-Cb	43.85	48.10	53.40	58.75	....
321	34.90	37.95	42.10	46.40	44.75
347	37.05	41.25	46.45	51.70	54.25
405	27.55	29.20	33.15	37.05	....
410	27.00	28.70	32.65	36.55	....
430	27.00	28.70	32.65	36.55	....
Inconel	47.28	57.90	68.50	79.20	....
Nickel	40.00	50.30	60.65	71.05	....
Nickel, Low Carbon	40.30	50.95	61.65	72.50	....
Monel	41.70	51.90	62.15	72.40	....
Copper*	....	....	....	....	46.00

	Strip, Carbon Base —Cold Rolled— 10%	Both Sides
Copper*	33.50	40.85

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.290	Cr Hot Work	0.45-0.495
Extra Carbon	0.345	W-Cr Hot Work	0.043-0.475
Special Carbon	0.41-0.45	V-Cr Hot Work	0.460
Oil Hardening	0.450	Hi-Carbon-Cr	0.830

Grade by Analysis (%) W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	....	4.170
18.25	4.25	1	4.75	....	2.385
18	4	2	9	....	2.755
18	4	2	....	....	1.845
18	4	1	....	....	1.680
9	3.5	..	....	....	1.275
13.5	4	3	....	....	1.945
13.75	3.75	2	5	....	2.325
6.4	4.5	1.9	....	5	1.185
6	4	3	....	6	1.430
1.5	4	1	....	8.5	1.040

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

Birmingham District	Basic	No. 2 Foundry	Malle-able	Besse-mer
AlabamaCity,Ala. R2	58.50	59.00	....	....
Birmingham R2	58.50	59.00‡	....	....
Birmingham U6	....	59.00‡	63.00	....
Woodward,Ala. W15	58.50	59.00‡	63.00	....
Cincinnati, deld.	....	66.70	....	....
Buffalo District				
Buffalo H1, R2	62.50	63.00	63.50	64.00
Tonawanda,N.Y. W12	62.50	63.00	63.50	64.00
N.Tonawanda,N.Y. T9	....	63.00	63.50	64.00
Boston, deld.	73.79	74.29	74.79	....
Rochester,N.Y., deld.	65.52	66.02	66.52	....
Syracuse,N.Y., deld.	66.62	67.12	67.62	....
Chicago District				
Chicago I-3	62.50	63.00	63.00	63.50
Gary,Ind. U5	62.50	....	63.00	....
S.Chicago,Ill. R2	62.50	....	63.00	....
S.Chicago,Ill. Y1	62.50	63.00	63.00	....
S.Chicago,Ill. U5	62.50	....	63.00	63.50
S.Chicago,Ill. W14	62.50	....	63.00	63.50
Milwaukee, deld.	64.96	65.46	65.46	65.96
Muskegon,Mich., deld.	....	76.83	76.83	....
Cleveland District				
Cleveland R2, A7	62.50	63.00	63.00	63.50
Akron,O., deld.	65.25	65.75	65.75	66.25
Mid-Atlantic District				
Birdsboro,Pa. B10	64.50	65.00	65.50	66.00
Chester,Pa. P4	64.50	65.00	65.50	....
Philadelphia, deld.	66.26	66.76	67.26	....
Swedeland,Pa. A3	64.50	65.00	65.50	66.00
New York, deld.	....	71.20	71.70	....
Newark,N.J., deld.	68.52	69.02	69.52	70.02
Philadelphia, deld.	66.38	66.88	67.38	67.88
Troy,N.Y. R2	64.50	65.00	65.50	66.00
Pittsburgh District				
NevilleIsland,Pa. P6	62.50	63.00	63.00	63.50
Pittsburgh (N&S sides), Aliquippa, deld.	....	64.45	64.45	64.98
McKeesRocks,Pa., deld.	....	64.10	64.10	64.63
Lawrenceville, Homestead, Wilmerding, Monaca,Pa., deld.	....	64.76	64.76	65.29
Verona, Trafford,Pa., deld.	64.79	65.32	65.32	65.85
Brackenridge,Pa., deld.	65.10	65.60	65.60	66.13
Bessemer,Pa. U5	62.50	....	63.00	63.50
Clairton,Rankin,S.Duquesne,Pa. U5	62.50	....	....	....
Midland,Pa. C18	62.50	....	....	....

Youngstown District	Basic	No. 2 Foundry	Malle-able	Besse-mer
Hubbard,O. Y1	....	....	63.00	....
Sharpsville,Pa. S6	62.50	....	63.00	63.50
Youngstown Y1	....	....	63.00	63.50
Mansfield,O., deld.	67.40	....	67.90	68.40
Duluth I-3	62.50	63.00	63.00	63.50
Erie,Pa. I-3	62.50	63.00	63.00	63.50
Everett,Mass. E1	64.50	65.00	65.50	....
Fontana,Calif. K1	70.50	71.00	....	....
Geneva,Utah C11	62.50	63.00	....	....
GraniteCity,Ill. G4	64.40	64.90	65.40	....
Ironton,Utah C11	62.50	63.00	....	....
LoneStar,Tex. L6	58.50*	59.00†	....	....
Minnequa,Colo. C10	64.50	65.00	65.50	....
Rockwood,Tenn. T3	....	59.00‡	63.00	....
Toledo,O. I-3	62.50	63.00	63.00	63.50
Cincinnati, deld.	68.26	68.76	....	....

*Phos. 0.51-0.75%; Phos. 0.31-0.50%, $59.50.
†Phos. 0.51-0.75%; Phos. 0.31-0.50%, $60.
‡Phos. 0.70-0.90%; intermediate (Phos. 0.31-0.69%), $60.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.25 for each 0.5% Si; 75 cents for each 0.50% Mn over 1%)

Jackson,O. I-3, J1	71.50
Buffalo H1	72.75

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$105.50
NiagaraFalls,N.Y. P15	105.50
Keokuk,Iowa, Open-hearth & Fdry, freight allowed K2	110.00
Keokuk, O.H. & Fdry, 12½ lb piglets, 16% Si, frgt allowed K2	113.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$76.50
Rockwood,Tenn. T3 (Phos. 0.035% max)	76.50
Troy,N.Y. R2 (Phos. 0.035% max)	70.50
Philadelphia, deld.	78.26
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	67.50
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	67.50
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	67.50
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	67.50

Warehouse Steel Products

Representative prices, per pound, subject to extras, f.o.b. Warehouse. City delivery charges are 15 cents per 100 lb except: Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane San Francisco, 10 cents; Atlanta, Houston, Seattle no charge.

	SHEETS				STRIP	BARS				Standard	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Mer-chant Qual.	H.R. Spec. Qual.	C.F. Rds.‡	H.R. Alloy 4140††‡	Structural Shapes	Carbon	Floor
Atlanta	8.17§	9.37§	9.83§	....	8.21	8.30	...	10.23	....	8.59	8.55	10.51
Baltimore	7.88	8.98	9.12	....	8.36	8.38	8.91	9.13[3]	15.69	8.75	8.26	10.81
Birmingham	7.80§	9.00§	9.52§	....	7.82	7.91	8.44	10.12	...	8.20	8.16	10.08
Boston	8.84	9.88	11.02	....	8.89	8.88	9.43	10.71	14.49	9.10	9.18	10.44
Buffalo	7.85	9.00	10.75	....	8.05	8.00	8.70	8.70	14.35	8.50	8.50	10.05
Chattanooga	8.00§	9.20§	9.10§	....	8.05	8.13	8.66	10.04	...	8.42	8.38	10.02
Chicago	7.80	9.00	9.70	....	7.82	7.91	8.44	8.35	13.95	8.20	8.16	9.49
Cincinnati	7.94	9.05	9.75	....	8.14	8.19	8.72	8.82	14.23	8.74	8.52	9.78
Cleveland	7.78	8.98	9.60	....	7.92	7.99	8.52	8.60	14.04	8.57	8.39	9.46
Denver	9.55	11.09	12.41	....	9.70	9.75	...	10.54	18.89	9.60	9.50	11.15
Detroit	8.03	9.25	10.05	....	8.17	8.18	8.71	8.68	14.21	8.74	8.51	9.74
Erie, Pa.	7.75	8.88	9.60[10]	....	7.90	8.00	8.65	8.70[10]	....	8.35	8.20	9.50
Houston	8.70	9.65	10.99	....	8.80	8.95	9.50	10.55	15.00	8.90	8.60	10.10
Jackson, Miss.	8.10§	9.30§	9.79§	....	8.15	8.23	8.76	10.23	...	8.52	8.48	10.11
Los Angeles	9.10	10.80	11.65	....	9.15	8.80	9.50	11.70	15.25	8.95	9.35	11.50
Milwaukee	7.93	9.13	9.83	....	7.95	8.04	8.57	8.58	14.08	8.41	8.29	9.62
Moline, Ill.	8.05	9.25	10.05	....	8.13	8.26	...	8.70	....	7.78	8.36	...
New York	8.45	9.66	10.23	60.20	8.90	8.83	9.38	10.61	14.39	8.91	9.01	10.07
Norfolk, Va.	7.85	...	...	..	8.30	8.35	...	10.80	....	8.60	8.10	9.60
Philadelphia	8.15	9.07	10.02	....	8.82	8.55	9.08	9.31	14.31	8.70	8.68	9.70
Pittsburgh	7.78	8.99	10.05	50.00	7.92	7.91	8.44	8.60	13.95	8.20	8.16	9.49
Portland, Oreg.	8.90	9.65	11.40	....	9.05	8.95	...	13.55	14.60	8.90	8.70	11.60
Richmond, Va.	8.05	...	10.09	....	8.45	8.70	9.20	10.00	....	8.80	8.35	9.70
St. Louis	8.14	9.34	10.06	....	8.19	8.28	8.81	8.96	14.31	8.67	8.52	9.86
St. Paul	8.29	9.49	10.31	....	8.43	8.52	...	9.21	....	8.94	8.90	9.87
San Francisco	8.75	10.30	10.80	....	8.95	8.80	9.35	12.30	15.25	8.85	8.85	11.15
Seattle	9.55	10.70	11.65	....	9.55	9.30	9.85	13.30	15.65	9.35	9.30	11.40
Spokane, Wash.	9.60	10.75	11.70	....	9.60	9.30	9.85	13.35	16.45	9.40	9.35	11.45
Washington	8.48	9.58	...	....	9.06	8.98	...	9.73	....	9.35	8.86	10.36

*Prices do not include gage extras; †prices include gage and coating extras (based on 12.50c zinc at Los Angeles and 13.50c at other points), except in Birmingham (coating extra excluded); ‡includes 35-cent bar quality extras; **½-in. and heavier; ††as annealed; §42 in. and under.

Base quantities, 2000 to 4999 lb except as noted; cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb, and in Los Angeles, 6000 lb and over; stainless sheets, 8000 lb except in Chicago New York and Boston, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb; [3]—400 to 999 lb; [5]—1000 to 1999 lb; [8]—2000 to 3999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beach Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., $128; Salina, Pa., $133; Niles, O., $138; Cutler, Utah, $148.

Super-Duty: Ironton, O., Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Pa., New Savage, Md., St. Louis, $165; Stevens Pottery, Ga., $175.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, O., Hawstone, Pa., $140; Warren, Niles, Windham, O., Hays, Latrobe, Morrisville, Pa., $145; E. Chicago, Ind., Joliet, Rockdale, Ill., $150; Lehigh, Utah, $165; Los Angeles, $170.

Super-Duty: Hays, Sproul, Hawstone, Pa., Niles, Warren, Windham, O., Leslie, Md., Athens, Tex., $157; Morrisville, Latrobe, Pa., $160; Curtner, Calif., $182.

Semisilica Brick (per 1000)

Clearfield, Pa., $145; Woodbridge, N. J., $128; Philadelphia, $130.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, O., $96; Clearfield, Pa., Portsmouth, O., $98.

High-Alumina Brick (per 1000)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $220; Danville, Ill., $223; Philadelphia, Clearfield, Pa., $230.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $275; Danville, Ill., $278; Philadelphia, Clearfield, Pa., $285.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $315; Danville, Ill., $318; Philadelphia, Clearfield, Pa., $325.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $177; Clearfield, Pa., $189.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $292; Clearfield, Pa., $311.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $221; Clearfield, Pa., $236.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, O., Gibsonburg, Narlo, O., $16; Thornton, McCook, Ill., $16.35; Dolly Siding, Bonne Terre, Mo., $15.

Magnesite (per net ton)

Domestic, dead-burned, bulk ⅓-in. grains with fines: Chewelah, Wash., Luning, Nev. $43; ⅝-in. grains with fines: Baltimore, $69.40.

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $38-39; 70%, $35-36; 60%, $31-32. Imported, net tons, f.o.b. cars point of entry, duty paid, metallurgical grade: European, $34; Mexican, $26.50.

Ores

Lake Superior Iron Ore

(Prices effective for the 1957 shipping season, gross tons, 51.50% iron natural, rail of vessel, lower lake ports.)

Old range bessemer	*$11.85*
Old range nonbessemer	*11.70*
Mesabi bessemer	*11.60*
Mesabi nonbessemer	*11.45*
Open-hearth lump	*12.70*
High phos.	*11.45*

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 30, 1957, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

Foundry and basic 52-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	*27.00-27.50*
N. African hematite (spot)	nom. 24.00-25.00
Brazilian iron ore, 68-69%	*35.00 36.00*

Tungsten Ore

Net ton unit, before duty

Foreign, wolframite, good commercial quality	*$27.00-28.00*
Domestic, concentrates, mine	55.00

Manganese Ore

Mn 46-48%, Indian (export tax included), $1.60-1.70 per long ton unit, c.i.f. U.S. ports, duty for buyer's account; other than Indian, $1.45-1.50; contracts by negtiation.

Chrome Ore

Gross ton f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian	
48% 3:1	$54.00-57.00
48% 2.8:1	51.00-54.00
48% no ratio	43.00-45.00
South African Transvaal	
48% no ratio	$37.50-39.00
44% no ratio	26.00-27.00
Turkish	
48% 3:1	$60.00-63.00
Domestic	
Rail nearest seller	
18% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb of Mo content, mines, unpacked	$1.18

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

55-60%	*$3.20-3.65*
60-65%	*3.65-3.75*

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

Sponge iron:	Cents
Swedish, c.i.f. Camden, N.J., c.l. in bags	8.50
Domestic:	
F.o.b., Johnstown, Pa., Niagara Falls, N. Y., in bags	9.50
F.o.b., Riverton, N. J., in bags	8.50
Canadian, f.o.b. shipping point	9.50
Electrolytic iron:	
Melting stock, 99.9% Fe, irregular fragments of ⅛ in. x 1.3 in.	26.00
Annealed, 99.5% Fe.	36.50
Unannealed (99+ % Fe)	34.00
Unannealed (99+ % Fe) (minus 325 mesh)	59.00
Powder Flakes (minus 16, plus 100 mesh)	29.00
Carbonyl Iron:	
98.1-99.9%, 3 to 20 microns, depending on grade, 86.00-275.00, in standard 200-lb containers; all minus 200 mesh.	
Aluminum:	
Atomized, 500 lb, drum, frght allowed	
Carlots	36.20
Ton lots	37.20
Antimony, 500 lb lots	32.00*
Brass, 5000-lb lots	36.80-46.80†
Bronze, 5000-lb lots	56.20-60.00†
Copper:	
Electrolytic	14.25*
Reduced	14.25*
Lead	7.50*
Manganese:	
Minus 35 mesh	64.00
Minus 100 mesh	70.00
Minus 200 mesh	75.00
Nickel, unannealed	$1.05
Nickel-Silver, 5000-lb lots	56.10-60.10†
Phosphor-Copper, 5000-lb lots	66.00
Copper (atomized) 5000-lb lots	48.50-56.00‡
Silicon	47.50
Solder	7.00*
Stainless Steel, 304	$1.05
Stainless Steel, 316	$1.40
Tin	14.50*
Zinc, 5000-lb lots	19.75-33.00‡
Tungsten:	Dollars
Melting grade, 99% 60 to 2000 mesh:	
1000 lb and over	4.20
Less than 1000 lb	4.35
Chromium, electrolytic 99.8% Cr min. metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 20% Zn, 10% Ni. **64% Cu, 18% Zn, 18% Ni.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Inches Diam.	Length	Per 100 lb
2	24	$57.75
2½	30	37.25
3	40	35.25
4	40	33.25
5⅛	40	33.00
6	60	30.00
7	60	26.75
8, 9, 10	60	26.50
12	72	25.50
14	60	25.50
16	72	24.50
17	60	25.50
18	72	24.50
20	72	24.00
24	84	24.75

CARBON

8	60	13.30
10	60	13.00
12	60	12.95
14	60	12.85
14	72	11.95
17	60	11.85
17	72	11.40
20	84	11.40
20	90	11.00
24	72, 84	11.25
24	96	10.95
30	84	11.05
40, 35	110	10.70
40	100	10.70

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.50-15.50
Connellsville, foundry	17.50-18.50

Oven Foundry Coke

Birmingham, ovens	$27.60
Cincinnati, deld.	32.53
Buffalo, ovens	29.50
Camden, N. J. ovens	29.50
Detroit, ovens	30.50
Pontiac, deld.	32.25
Saginaw, deld.	33.83
Erie, Pa., ovens	30.50
Everett, Mass., ovens New England, deld.	30.55*
Indianapolis, ovens	29.75
Ironton, O., ovens	28.00
Cincinnati, deld.	28.25
Kearny, N.J., ovens	30.00
Lone Star, Tex., ovens	25.50
Milwaukee, ovens	30.50
Painesville, O., ovens	30.50
Cleveland, deld.	32.55
Philadelphia, ovens	29.50
St. Louis, ovens	31.50
Neville Island (Pittsburgh), Pa., ovens	29.25
St. Paul, ovens	29.75
Chicago, deld.	33.14
Swedeland, Pa., ovens	29.50
Terre Haute, Ind., ovens	29.75

*Or within $4.55 freight zone from works.

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$7.15	$7.15	$7.15	$7.40
Bar Size Angles	7.11	7.11	7.11	7.26
Structural Angles	7.30	7.30	7.30	7.60
I-Beams	7.75	7.75	7.75	8.15
Plates (basic bessemer)	9.30	9.30	9.30	9.70
Sheets, H.R.	8.55	8.55	8.55	8.85
Sheets, C.R. (drawing quality)	8.95	8.95	8.95	9.35
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	27.17	27.17	27.17	27.64
Barbed Wire (†)	6.80	6.80	6.80	7.25
Merchant Bars	7.15	7.15	7.15	7.50
Hot-Rolled Bands	7.25	7.25	7.25	7.65
Wire Rods, Thomas Commercial No. 5	6.38	6.38	6.38	6.78
Wire Rods, O-H Cold Heading Quality No. 5	6.72	6.72	6.72	7.12
Bright Common Wire Nails (‡)	8.45	8.45	8.45	8.57
Oil Country Pipe: Mills withdrawn temporarily.				

†Per 82-lb. net, reel. ‡Per 100-lb kegs, 20d nails and heavier.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	36.00
Toluene, one deg.	32.00-34.00
Industrial xylene	32.00-35.00

Per ton, bulk, ovens

Ammonium sulfate	$32.00

Cents per pound, producing point

Phenol: Grade 1, 15.00; Grade 2-3, 14.50; Grade 4, 16.50; Grade 5, 15.25.

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si. $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx). Base price per net ton; $255, Johnstown, Duquesne, Sheridan, Pa., Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%). Lump $263 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max, 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices, Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn, packed, carload 26.8c, ton lot 28.4c, less ton 29.6c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max). Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lot 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carload, 33c; 2000 lb to min carload, 35c; 500 lb to 1999 lb, 37c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 13.8c per lb of alloy. Packed, c.l. 15c, ton 15.45c, less ton 16.45c, f.o.b. Alloy, W. Va., Ashtabula, O., Marietta, O., Sheffield, Ala., Portland, Oreg. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade. Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $200 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $225 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l. lump, bulk, 27.75c per lb of contained Cr; c.l. packed 29.3c, ton lot 31.05c; less ton 32.45c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-71%). Contract, carload, lump, bulk, C 0.025% max (Simplex) 34.75c per lb contained Cr, 0.02% max 41.5c, 0.03% max 41c, 0.06% max 39.5c, 0.1% max 39c, 0.15% max 38.75c, 0.2% max 38.5c, 0.5% max 38.25c, 1.0% max 37.5c, 1.5% max 37.35c, 2.0% max 37.25c. Ton lot, add 3.4c, less ton add 5.1c. Carload packed add 1.75c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). Contract, c.l., 2 in. x D, bulk 29.05c per lb contained Cr. Packed, c.l. 30.65c, ton 32.45c, less ton 33.95c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, 8 M x D, 20.85c, per lb of alloy, ton lot 22.10c; less ton lot 23.3c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome-Silicon: (Cr 39-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 41.35c per lb of contained Cr; 1" x down, bulk 42.35c. Delivered.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed 2" x D plate (about ¼" thick) $1.29 per lb, ton lot $1.31, less ton lot $1.33. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55%, or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1, $1.05 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si. Packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 13.9c per lb of contained Si. Packed c.l. 16.4c, ton lot 17.85c, less ton 19.5c, f.o.b. Alloy, W. Va., Ashtabula, Marietta, O., Sheffield, Ala., and Portland, Oreg. Spot, add 0.45c.

Low Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 15.25c per pound contained silicon. Packed, c.l. 17.25c, ton lot, 19.05c; less ton 20.4c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 16.4c per lb of contained Si. Packed, c.l. 18.30c, ton lot 19.95c, less ton 21.2c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 19.5c per lb of contained Si. Packed, c.l. 21.15c, ton lot 22.55c, less ton 23.6c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 0.75% max Fe, 0.07% max Ca). C.l. lump, bulk, 21.5c per lb of Si. Packed, c.l. 23.15c, ton lot 24.45c, less ton 25.45c. Add 0.5c for max 0.03% Ca grade. Deduct 0.5c for max 2% Fe grade analyzing min 96.5% Si. Spot, add 0.25c.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 10.65c per lb of alloy. ton lot, packed, 11.8c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 27.25c per lb of alloy, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Bortam: (B 1.5%-1.9%). Ton lot, 45c per lb; less than ton lot, 50c per lb.

Carbortam: (B 1 to 2%). Contract, lump, carload 9.50c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3½ lb each and containing 2 lb of Cr). Contract, carload, bulk, 19c per lb of briquet, carload packed in box pallets 19.2c, in bags 20.1c; 3000 lb to c.l. in box pallets 20.4c; 2000 lb to c.l. in bags, 21.3c; less than 2000 lb in bags 22.2c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Contract, carload, bulk 14.8c per lb of briquet; c.l., packed, pallets 15c, bags 16c; 3000 lb to c.l., pallets 16.2c; 2000 lb to c.l. bags, 17.2c, less ton 18.1c. Delivered. Add 0.25 for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). Contract, c.l. bulk 15.1c per lb of briquet; c.l. packed, pallets, 15.3c; bags 16.3c, 3000 lb to c.l., pallets, 16.5c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 00.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing 2 lb of Si). Contract, carload, bulk, 7.7c per lb of briquet, packed, pallets, 7.9c; bags 8.9c; 3000 lb to c.l., pallets 9.5c; 2000 lb to c.l. bags 10.5c; less ton 11.4c. Delivered. Spot, add 0.25c. (Small size—weighing approx. 2½ lb and containing 1 lb of Si). Carload, bulk 7.85c. Packed, pallets 8.05c; bags 9.05c; 3000 lb to c.l. pallets 9.65c; 2000 lb to c.l. bags 10.65c; less ton 11.55c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.41 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more $3.15 per lb of contained W; 2000 lb W to 5000 lb W, $3.25; less than 2000 lb W, $3.37. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, $6.90 per lb of contained Cb. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb plus Ta 60% min, C 0.30% max). Ton lot 2" x D, $4.95 per lb of contained Cb plus Ta, delivered; less ton lot $5.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, c.l. packed ½-in. x 12 M 19c per lb of alloy, ton lot 20.15c, less ton 21.4c. Delivered. Spot, add 0.25c.

Graphidox No. 5: (Si 48-52%, Ca 5.7%, Ti 9-11%). C.l. packed, 19c per lb of alloy, ton lot 20.15c; less ton lot 21.4c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.1c per lb of alloy; ton lot 19.55c; less ton lot 20.8c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

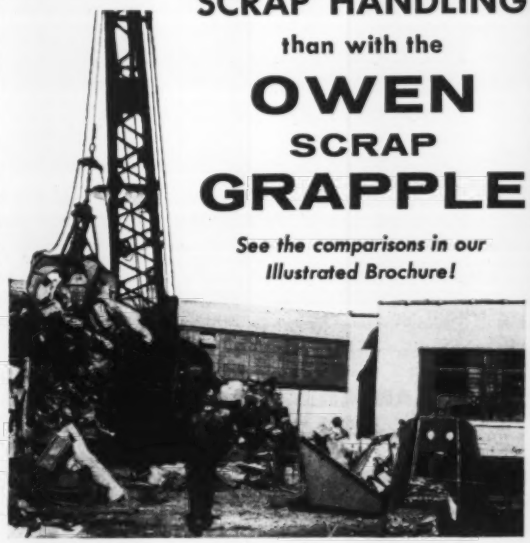
Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 18.50c. Packed c.l. 19.50c, 2000 lb to c.l. 20.50c, less than 2000 lb 21c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carload, f.o.b. sellers' works. Mt. Pleasant, Siglo, Tenn., $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, in 200-lb container, f.o.b. Langeloth and Washington, Pa., $1.68 in all sizes except powdered which is $1.74.

Technical Molybdic-Oxide: Per lb contained Mo, in cans, $1.39; in bags, $1.38, f.o.b. Langeloth and Washington, Pa.

There's No Better Way for EFFICIENT . . . ECONOMICAL SCRAP HANDLING than with the OWEN SCRAP GRAPPLE



See the comparisons in our Illustrated Brochure!

The OWEN BUCKET CO. • BREAKWATER AVE. • CLEVELAND 2, OHIO

Branches: New York, Philadelphia, Chicago, Berkeley, Calif., Ft. Lauderdale, Fla.

Manufacturers of OWEN CLAMSHELL BUCKETS

KARDONG CIRCLE BENDER

For Concrete Reinforcing Bars

This is a powerful and fast machine for heavy duty work in both fabricating plants or in the field where large tonnage is required. It will handle as high as 20 tons a day. Circles of any size required in concrete reinforcing work from 18 inches in diameter up can be bent on this machine. It will bend bars with two or more radii on the same bar without stopping the machine.

Made in two sizes

Model "C" Capacity 1¼ inch
Model "CA" Capacity 1 inch

Write for catalog of our complete line of reinforcing bar benders.

KARDONG BROTHERS, INC.
MINNEAPOLIS 13, MINN.

DYKEM STEEL BLUE

Stops Losses making Dies and Templates

Popular package is 8-oz. can fitted with Bakelite cap holding soft-hair brush for applying right at bench; metal surface ready for layout in a few minutes. The dark blue background makes the scribed lines show up in sharp relief, prevents metal glare. Increases efficiency and accuracy.

Write for sample on company letterhead

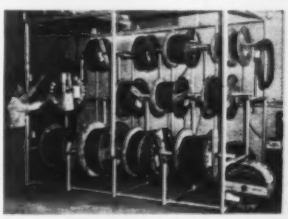
THE DYKEM COMPANY
2303H North 11th St. • St. Louis 6, Mo.

Reels Ready to Roll When You Need Wire Rope

Stocks on hand . . . that's good to know when you need wire rope. It assures steady production on your equipment when time counts most. There are always adequate stocks of Yellow Strand Wire Rope in the right types and sizes — conveniently near you. Yellow Strand distributors and Broderick & Bascom Warehouses are strategically located throughout the U. S. A., always ready to serve you.

High quality Yellow Strand Wire Rope, resulting from more than 80 years manufacturing experience, means long wire rope life and lower costs. Take advantage of the extra service you get from Yellow Strand — and the money-saving feature of "stocks on hand." Write us for the name of your nearest distributor.

This is typical of many Yellow Strand distributor wire rope stocks. You have it when you need it. Experienced counsel on wire rope application is available at your distributors or from a Broderick & Bascom sales engineer. Ask for it today.

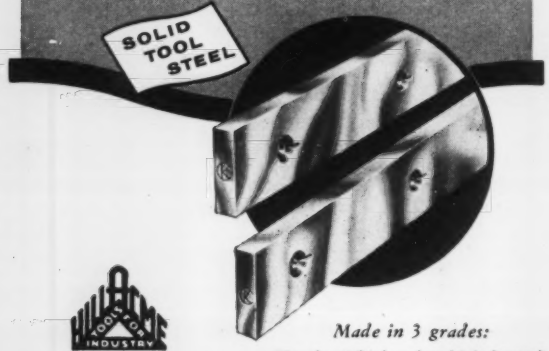


Yellow Strand®

Manufacturers of Wire Rope for over 80 Years

BRODERICK & BASCOM ROPE CO.
4203 Union Blvd. • St. Louis 15, Mo.

"CLEVELAND"
SQUARING SHEAR BLADES



Made in 3 grades:
"Peerless" (high carbon high chrome)
"Century" (high alloy)
"Standard" (low alloy)

Used by EVERY manufacturer of squaring shears as original equipment. Because they are ground to the closest tolerances in the knife industry — "CLEVELAND" shear blades insure maximum cutting life . . .

We make a complete line of knives and shear blades for every industrial need. We have learned a lot about YOUR problems in the past 40 years — ask us.

Manufactured and sold by:

THE HILL ACME COMPANY
CLEVELAND KNIFE DIVISION
1201 West 65th St. • Cleveland 2, Ohio

ASK ABOUT

MICCROSOL

for Corrosion Resistant Coatings on Tanks, Ducts, Housings, Racks, etc.

MICHIGAN CHROME *and Chemical Company*

8615 GRINNELL AVENUE
DETROIT 13, MICHIGAN

PALMGREN Machine Vises and Rotary Tables

Used in all Industries — Everywhere
There are 64 different models and types of Palmgren vises, rotary tables, milling attachments and other machine tool accessories — the most complete line of vises and tables available anywhere.

No. 608 6" Swivel Machine Vise, $99.95
Write for Catalog 204
No. 83 8" Rotary Table, $79.95

CHICAGO TOOL AND ENGINEERING CO., 8359 S. Chicago Ave., Chicago 17, Ill.

To Lower your Overhead..

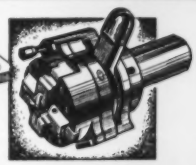
BROWNING ELECTRIC TRAVELING CRANES AND HOISTS
up to 125-TON CAPACITY

VICTOR R. BROWNING & CO., INC. WILLOUGHBY (Cleveland), OHIO

for Corrugating and Complete Line of Culvert Equipment—Slitting and Coiling Equipment for Ferrous and Non-Ferrous Material in All Capacities—Warehouse and Steel Mill Cut to Length Lines for Shearing and Levelling Sheets from Coils—Shears for Shearing Sheets and Plates Both Underdriven and Overdriven Types in Capacities to 1¼" Plate.

STAMCO, Inc., New Bremen, Ohio

H&G Insert Chaser DIE HEADS



famous for accuracy and straightness of threads, low chaser costs, less downtime, more pieces per day.

THE EASTERN MACHINE SCREW CORP., 22-42 Barclay Street, New Haven, Conn.
Pacific Coast Representative: *A. C. Berbringer, Inc., 334 N. San Pedro St., Los Angeles, California.* Canada: *F. F. Barber Machinery Co., Toronto, Canada.*

Versatility counts in
HOT DIP GALVANIZING
any size or shape product, any size
order from the smallest to the largest

Excellent facilities for export shipment

ENTERPRISE
GALVANIZING COMPANY
2523 E. Cumberland Street Philadelphia 25, Pa.

INTRODUCTION TO THE STUDY OF HEAT TREATMENT OF METALLURGICAL PRODUCTS
By Albert Portevin

Fundamental knowledge and essential principles of heat treatment of steel are presented in simple and understandable manner. Research engineers, metallurgical students and steel plant metallurgists engaged in metallurgical investigations and the heat treatment of ferrous and non-ferrous metals will find this book of inestimable value.

246 pages **4 tables**
69 Illustrations **Price $5.00 Postpaid**

THE PENTON PUBLISHING CO.
Book Department, 1213 W. 3rd St., Cleveland 13, O.

Sharp Break Pulls Scrap Down

Index on prime steelmaking grades drops to $56, lowest since August. Limited new buying, substantial stocks and slower pace of finished steel demand reflected

Scrap Prices, Page 170

Pittsburgh—Two major buyers bought leading scrap grades last week. Their buys were for similar prices: $55 for No. 1 heavy melting, $49 for No. 2 heavy melting, and $46 for No. 2 bundles. Some market observers are surprised by the rapid price decline. There appears to be an excess of industrial scrap in this area. The price decline has affected almost all grades. Machine shop turnings are being shipped for $38—off $4 from last week's quotation. Others are down from $2 to $4.

Chicago—The downward trend in scrap prices continues, but it is an orderly retreat from the all-time high level attained in December. Generally, the market is $1 to $3 a ton lower than it was a week ago. The easiness centers chiefly in the open-hearth and blast furnace grades.

Philadelphia—Major open-hearth grades of scrap have eased on light buying. No. 1 heavy melting, No. 1 bundles and No. 1 busheling are quoted at $59, delivered, No. 2 at $48, No. 2 bundles at $48.50. A more thorough test is expected shortly.

Reductions also are noted in several other grades of steel scrap. Electric furnace bundles are off $2 to $61, delivered.

The cast grades are firm. Malleable prices are nominal.

New York—Scrap brokers' buying prices are unchanged here. But the market undertone is weak, and both buyers and sellers are marking time.

Boston — Steel scrap prices on all grades are off $2 to $3 a ton. Brokers are paying $48, shipping point, for No. 1 heavy melting. This is down $6 a ton from the peak reached in December.

Cleveland—Scrap prices are off $6 to $7 a ton on limited purchases here and in the Valley. A local mill bought No. 1 heavy melting at $54, down $6 from the last prevailing price. In the Valley, a mill bought No. 2 steel at $49-$50.

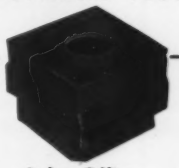
Except for these two purchases, the market is devoid of new buying. Meanwhile, tonnage is still moving on old contracts placed for January shipment. The tone of the market is weak, reflecting not only limited consumer buying but weakness at other market points.

The softness in steel scrap has spread to the other grades, blast furnace items being off $3 to $4 a ton, and foundry grades $2 to $5.

Youngstown—The scrap market here is weak, reflecting the hesitancy in new steel ordering, tight money and other factors. There have been no representative orders recently. Some area mills intimate they may not be in the market for February tonnage.

Steel production continues at high level, assuring heavy consumption of scrap. Inventories in dealers' yards and in mill yards are not excessive. The recent

(*Please turn to page* 175)

EUREKA FIRE BRICK WORKS
Works: Mt. Braddock, Fayette Co., Pa.
Dunbar, Pa. 4213
COVERED HOT TOP BRICK
INGOT MOLD PLUGS

Sales Office
132 S. Whitfield St.
PITTSBURGH 6, PA. EM: 2-0614

It's just plain HORSE SENSE...

to send your Mixed-Clean or Contaminated Stainless & Alloy Scrap to...
ALLOYS & METAL Specialties, Inc.
Where it's SORTED — GRADED and TESTED to assure you TOP DOLLAR!
CONSTANT CONSUMERS AND SUPPLIERS OF STAINLESS STEEL AND SPECIAL ALLOYS
alloys & metal Specialties, Inc.
6901 SOUTH BELL AVE. CHICAGO 36, ILL.
PHONE • WIRE • WRITE PRospect 8-4466

Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Jan. 30	$56.00
Jan. 23	59.17
Dec. Avg.	64.29
Jan. 1956	52.17
Jan. 1952	43.00

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	*54.00-55.00*
No. 2 heavy melting	*48.00-49.00*
No. 1 bundles	*54.00-55.00*
No. 2 bundles	*45.00-46.00*
No. 1 busheling	*54.00-55.00*
Machine shop turnings	*37.00-38.00*
Mixed borings, turnings	*37.00-38.00*
Short shovel turnings	*41.00-42.00*
Cast iron borings	*41.00-42.00*
Cut structurals, 3 ft. lengths	*66.00-67.00*
Cut structurals, 2 ft. and under	*68.00-69.00*
Heavy turnings	*53.00-54.00*
Punchings & plate scrap	*66.00-67.00*
Electric furnace bundles	*66.00-67.00*

Cast Iron Grades

No. 1 cupola	53.00-54.00
Heavy breakable cast	50.00-51.00
Unstripped motor blocks	40.00-41.00
No. 1 machinery cast	60.00-61.00

Railroad Scrap

No. 1 R.R. heavy melt.	*63.00-64.00*
Rails, 2 ft and under	*78.00-79.00*
Rails, 18 in. and under	*79.00-80.00*
Rails, random lengths	*75.00-76.00*
Railroad specialties	*70.00-71.00*

Stainless Steel Scrap

18-8 bundles & solids	*500.00-540.00*
18-8 turnings	*420.00-440.00*
430 bundles & solids	110.00-120.00
430 turnings	80.00-85.00

CLEVELAND

No. 1 heavy melting	*53.00-54.00*
No. 2 heavy melting	*46.00-47.00*
No. 1 bundles	*53.00-54.00*
No. 2 bundles	*40.00-41.00*
No. 1 busheling	*53.00-54.00*
Machine shop turnings	*33.00-34.00*
Mixed borings, turnings	*36.00-37.00*
Short shovel turnings	*36.00-37.00*
Cast iron borings	*36.00-37.00*
Cut foundry steel	*55.00-56.00*
Cut structurals plates 2 ft and under	*59.00-60.00*
Alloy free, short shovel turnings	*40.00-41.00*
Electric furnace bundles	*54.00-55.00*

Cast Iron Grades

No. 1 cupola	*55.00-56.00*
Charging box cast	*44.00-45.00*
Heavy breakable cast	*44.00-45.00*
Stove plate	*51.00-52.00*
Unstripped motor blocks	*36.00-37.00*
Brake shoes	*44.00-45.00*
Clean auto cast	*53.00-54.00*
Burnt cast	*42.00-43.00*
Drop broken machinery	*57.00-58.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*56.00-57.00*
R.R. malleable	*63.00-64.00*
Rails, 2 ft and under	*78.00-79.00*
Rails, 18 in. and under	*79.00-80.00*
Rails, random lengths	*73.00-74.00*
Cast steel	*66.00-67.00*
Railroad specialties	*69.00-70.00*
Uncut tires	*68.00-69.00*
Angles, splice bars	*68.00-69.00*
Rails, rerolling	*80.00-81.00*

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	450.00-500.00
18-8 turnings	300.00-310.00
430 clips, bundles, solids	*100.00-105.00*
430 turnings	*45.00-50.00*

YOUNGSTOWN

No. 1 heavy melting	*56.00-57.00*
No. 2 heavy melting	*49.00-50.00*
No. 1 bundles	*56.00-57.00*
No. 2 bundles	*43.00-44.00*
No. 1 busheling	*56.00-57.00*
Machine shop turnings	*34.00-35.00*
Short shovel turnings	*41.00-42.00*
Cast iron borings	*41.00-42.00*
Low phos.	*57.00-58.00*
Electric furnace bundles	*57.00-58.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*59.00-60.00*

CHICAGO

No. 1 heavy melting	*53.00-56.00*
No. 2 heavy melting	*43.00-44.00*
No. 1 factory bundles	*56.00-57.00*
No. 1 dealer bundles	*52.00-53.00*
No. 2 bundles	*40.00-41.00*
No. 1 busheling	*53.00-56.00*
Machine shop turnings	*35.00-36.00*
Mixed borings, turnings	*37.00-38.00*
Short shovel turnings	*37.00-38.00*
Cast iron borings	*37.00-38.00*
Cut structurals, 3 ft	*58.00-60.00*
Punchings & plate scrap	*59.00-61.00*

Cast Iron Grades

No. 1 cupola	48.00-49.00
Stove plate	44.00-45.00
Unstripped motor blocks	36.00-37.00
Clean auto cast	53.00-54.00
Drop broken machinery	53.00-54.00

Railroad Scrap

No. 1 R.R. heavy melt.	*57.00-58.00*
R.R. malleable	*60.00-61.00*
Rails, 2 ft and under	*73.00-74.00*
Rails, 18 in. and under	*74.00-75.00*
Angles, splice bars	*63.00-64.00*
Rails, rerolling	*71.00-72.00*

Stainless Steel Scrap

18-8 bundles & solids	510.00-525.00
18-8 turnings	355.00-375.00
430 bundles & solids	105.00-110.00
430 turnings	65.00-70.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*45.00-46.00*
No. 2 heavy melting	*39.00-40.00*
No. 1 bundles	*45.00-46.00*
No. 2 bundles	*33.00-34.00*
No. 1 busheling	*45.00-46.00*
Machine shop turnings	*27.00-29.00*
Mixed borings, turnings	*28.00-30.00*
Short shovel turnings	*29.00-30.00*
Punchings & plate scrap	*56.00-57.00*

Cast Iron Grades

No. 1 cupola	51.00
Charging box cast	44.00
Stove plate	45.00
Heavy breakable	44.00
Unstripped motor blocks	32.00
Clean auto cast	55.00
Malleable	56.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	49.00
No. 2 heavy melting	*46.50*
No. 1 bundles	49.00
No. 2 bundles	40.50
No. 1 busheling	49.00
Machine shop turnings	36.00†
Short shovel turnings	39.00†

Cast Iron Grades

No. 1 cupola	*47.00*
Charging box cast	*40.00*
Heavy breakable cast	*40.00*
Unstripped motor blocks	*40.00*
Brake shoes	51.00
Clean auto cast	50.50
Stove plate	41.00

Railroad Scrap

No. 1 R.R. heavy melt.	56.00
Rails, 18 in. and under	*76.00*
Rails, rerolling	*76.00†*
Rails, random lengths	65.00
Angles, splice bars	*66.00*

†Nominal.

PHILADELPHIA

No. 1 heavy melting	59.00
No. 2 heavy melting	48.00
No. 1 bundles	59.00
No. 2 bundles	*48.50*
No. 1 busheling	59.00
Electric furnace bundles	*61.00*
Mixed borings, turnings	44.00
Machine shop turnings	*42.00-43.00*
Short shovel turnings	*46.00-47.00*
Heavy turnings	*54.00*
Structurals & plates	*63.00-64.00*
Couplers, springs, wheels	73.00†
Rails, crops, 2 ft & under	80.00-82.00

Cast Iron Grades

No. 1 cupola	54.00-56.00
Malleable	67.00-68.00†
Heavy breakable cast	59.00
Drop broken machinery	60.00-61.00

†Nominal.

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	55.00-56.00
No. 2 heavy melting	47.00-48.00
No. 1 bundles	55.00-56.00
No. 2 bundles	45.00-46.00
Machine shop turnings	35.00-35.50
Mixed borings, turnings	36.00-37.00
Short shovel turnings	39.00-40.00
Low phos. (structural & plate	58.00-59.00

Cast Iron Grades

No. 1 cupola	46.00-47.00
Unstripped motor blocks	39.00-40.00
Heavy breakable	50.50-51.50

Stainless Steel

18-8 sheets, clips, solids	475.00-485.00
18-8 borings, turnings	345.00-370.00
430 sheets, clips, solids	110.00-115.00
410 sheets, clips, solids	100.00-105.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*48.00-48.50*
No. 2 heavy melting	*38.50-39.50*
No. 1 bundles	*48.00-48.50*
No. 2 bundles	*37.50-38.00*
No. 1 busheling	*48.00-48.50*
Machine shop turnings	*30.00-31.00*
Mixed borings, turnings	*31.00-32.00*
Short shovel turnings	*34.00-35.00*
No. 1 cast	*44.00-45.00*
Mixed cupola cast	42.00-43.00
No. 1 machinery cast	*44.00-45.00*

BUFFALO

No. 1 heavy melting	*59.00-60.00*
No. 2 heavy melting	*50.00-51.00*
No. 1 bundles	*59.00-60.00*
No. 2 bundles	*46.00-47.00*
No. 1 busheling	*59.00-60.00*
Mixed borings, turnings	*36.00-37.00*
Machine shop turnings	*34.00-35.00*
Short shovel turnings	*41.00-42.00*
Cast iron borings	34.00-35.00
Low phos.	*63.00-64.00*

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	49.00-50.00
No. 1 machinery	54.00-55.00

Railroad Scrap

Rails, random lengths	*68.00-69.00*
Rails, 3 ft and under	*70.00-71.00*
Railroad specialties	*60.00-61.00*

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*56.00-57.00*
No. 2 heavy melting	*46.00-47.00*
No. 1 bundles	*56.00-57.00*
No. 2 bundles	*40.00-41.00*
No. 1 busheling	*56.00-57.00*
Machine shop turnings	*36.00-37.00*
Mixed borings, turnings	*36.00-37.00*
Short shovel turnings	*39.00-40.00*
Cast iron borings	*36.00-37.00*
Low phos. 18 in.	*62.00-63.00*

Cast Iron Grades

No. 1 cupola	*46.00-47.00*
Heavy breakable cast	*45.00-46.00*
Charging box cast	*45.00-46.00*
Drop broken machinery	*56.00-57.00*

Railroad Scrap

No. 1 R.R. heavy melt.	59.00-60.00
Rails, 18 in. and under	*77.00-78.00*
Rails, random lengths	*69.00-70.00*

BIRMINGHAM

No. 1 heavy melting	46.00-47.00
No. 2 heavy melting	*41.00-42.00*
No. 1 bundles	46.00-47.00
No. 2 bundles	*36.00-37.00*
No. 1 busheling	46.00-47.00
Cast iron borings	27.00-28.00
Short shovel turnings	38.00-39.00
Machine shop turings	37.00-38.00
Bar crops and plate	*57.00-58.00*
Structural & plate, 2 ft.	*57.00-58.00*
Electric furnace bundles	*52.00-53.00*
Electric furnace, 2 ft & under	52.00-53.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	53.00-54.00
Stove plate	51.00-52.00
Unstripped motor blocks	44.00-45.00
Charging box cast	40.00-41.00
No. 1 wheels	45.00-46.00

Railroad Scrap

No.1 R.R. heavy melt.	*53.00-54.00*
Rails, 18-in. and under	*71.00-72.00*
Rails, rerolling	*64.00-65.00*
Rails, random lengths	*64.00-65.00*
Angles, splice bars	*63.00-64.00*

SEATTLE

No. 1 heavy melting	56.00
No. 2 heavy melting	53.00
No. 1 bundles	53.00
No. 2 bundles	33.00-35.00
Machine shop turnings	30.00-33.00
Mixed borings, turnings	30.00-33.00
Electric furnace No. 1	62.00-65.00

Cast Iron Grades

No. 1 cupola	54.00-56.00
Heavy breakable cast	48.00-50.00
Unstripped motor blocks	48.00-49.00
Stove plate (f.o.b. plant)	42.00-43.00

LOS ANGELES

No. 1 heavy melting	54.00
No. 2 heavy melting	52.00
No. 1 bundles	53.00
No. 2 bundles	*38.00*
Machine shop turnings	*35.00*

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	58.00

SAN FRANCISCO

No. 1 heavy melting	59.00
No. 2 heavy melting	57.00
No. 1 bundles	58.00
No. 2 bundles	44.00
Machine shop turnings	38.00
Mixed borings, turnings	38.00
Cast iron borings	38.00
Heavy turnings	38.00
Short shovel turnings	40.00
Cut structurals	63.00

Cast Iron Grades

No. 1 cupola	60.00
Charging box cast	47.00-49.00
Stove plate	48.00
Heavy breakable cast	42.00
Unstripped motor blocks	50.00
Clean auto cast	60.00
No. 1 wheels	50.00
Drop broken machinery	62.00

HAMILTON, ONT.

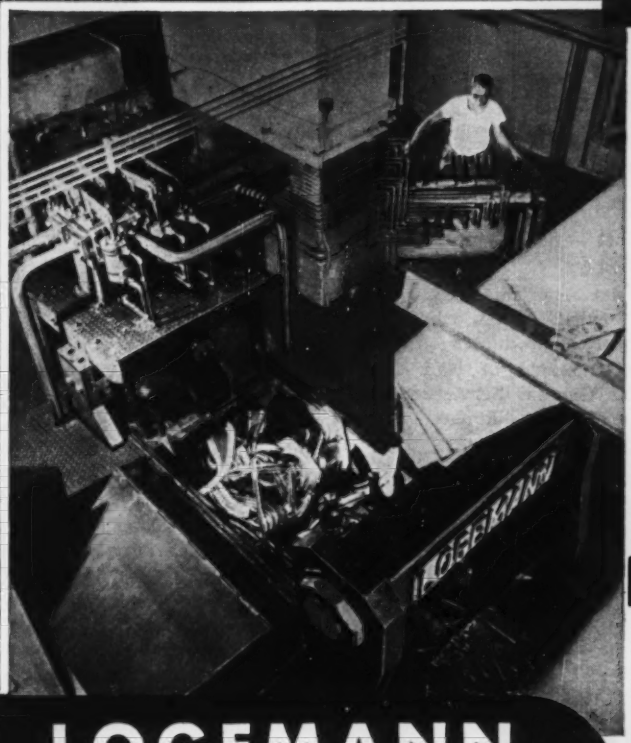
No. 1 heavy melting	54.00
No. 2 heavy melting	47.00
No. 1 bundles	54.00
No. 2 bundles	40.00
Mixed steel scrap	46.00
Busheling, new factory: Prepared	52.00
Unprepared	48.00
Short steel turnings	35.00

Cast Iron Grades†

No. 1 machinery cast	50.00

†F.o.b., Hamilton, Ont.

LOGEMANN



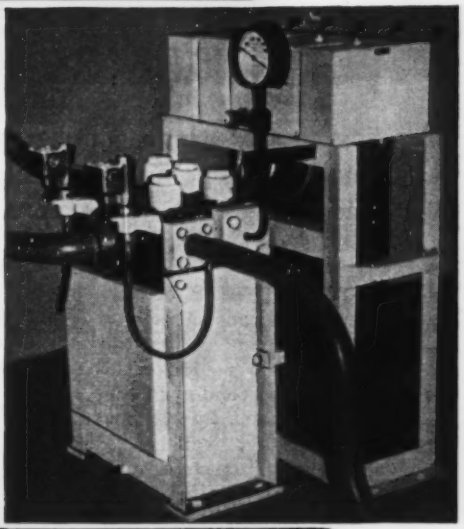
LOGEMANN Metal Balers

. . . powerful . . . compact . . . capable of high tonnage output!

In the large stamping plants and rolling mills where it is critically important that trim and stamping skeletons are quickly disposed of to avoid interference with production, LOGEMANN metal balers are relied on to keep ahead of production and pack such scrap into high density, self-cohering bricks for re-melting.

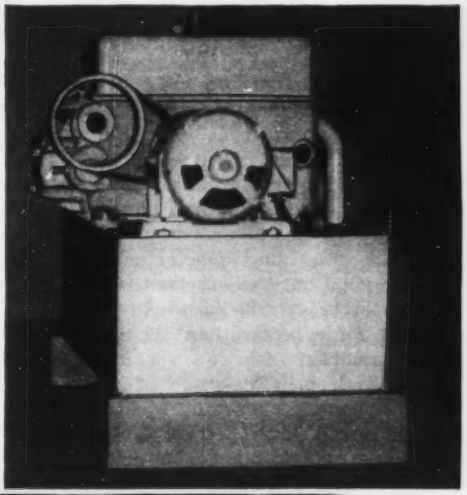
Hundreds of installations have established new records for tonnage, minimum maintenance, reliability, over extended periods of uninterrupted operation at high-speed.

LOGEMANN models are not confined to the large sizes. Many small plants have found it profitable to use smaller sizes embodying the same features of reliability, at minimum operating cost. Interested parties are invited to write for details. Information as to the character of the scrap, tonnage to be handled in a given period of hours, and range of gauges is helpful in determining the proper model.



HYDRAULIC VALVES

The illustration shows a close-coupled hydraulic valve, operated by compressed-air cylinders for high-speed distribution of large gallonage of fluid at high pressure. LOGEMANN engineers have designed and built valves for many unusual as well as standard applications, and will welcome inquiries, with an outline of the conditions and requirements.



HYDRAULIC PUMPS

The opposed-cylinder close-coupled double pressure pump shown in the illustration is mounted on an individual tank to conserve floor space under present crowded plant and operating conditions. When requesting details, please indicate the nature of the service, pressure and gallonage requirements, and the fluid to be handled.

LOGEMANN BROTHERS CO.

3126 W. BURLEIGH STREET • MILWAUKEE 10, WISCONSIN

Buyer's Market Returns

With little fear of crippling strikes in 1957, users of nonferrous metals are being encouraged to level out their production cycles. Sales also will be spread out

Nonferrous Metal Prices, Pages 174 & 175

INCREASED SUPPLIES of nonferrous metals are causing users to readjust their buying habits.

Metal buyers are no longer interested in building comfortable inventories. They point out: 1. Most metals are readily available. 2. Three-year labor contracts give assurance that there is no need to overbuy during the spring in anticipation of possible summer strikes.

What It Means—With this philosophy developing in purchasing circles, the sales patterns of all nonferrous metals could change in '57. Sales may show a gradual build-up during the entire year rather than peak in first quarter.

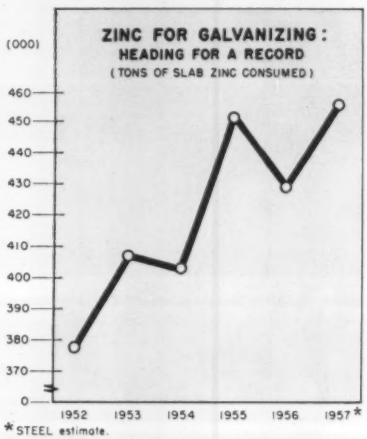
Copper Sales Mixed

Wire and cable makers are buoying the copper industry. Primary producers report sales are adequate, and that inventories are not out of proportion. With most February orders in, people in the primary red metal industry are predicting that first quarter sales will be good but not excellent. An upturn in brass mill sales will be a must for a better than average second quarter.

The U.S. primary price of 36 cents a pound is now the highest in the world. The London Metal Exchange quotation is holding near 32.50 cents a pound. U.S. secondary producers are quoting 34.75 cents, but might be willing to ship and order for 34 cents if better than average tonnages were involved. While the stage is set for a drop in the primary price, there is at least one retarding factor — producers cannot be sure that it will help sales.

Zinc, Lead Report

End of month orders for zinc showed a flurry of activity. Zinc producers are reporting "good, but not heavy sales." With comfortable inventories, producers offered substantial tonnages of lead and zinc to the General Services Administration during January for stockpile. GSA turned cautious and finally took only about 40 to 60 per cent of the tonnages offered by individual companies.



*STEEL estimate.
Source: U.S. Bureau of Mines and American Zinc Institute.

Lead sales are fair. Lead sheathing sales for telephone and shipboard cable are adding some strength to the market. Battery makers are still in the market but are in the "off season." Battery men report that new 12-volt batteries use about 10 per cent more lead, but they last longer than 6-volt systems.

Aluminum Production Cut

The nation's primary aluminum capacity is being temporarily reduced by about 11 per cent. Reason: The output of the Pacific Northwest Power Supply (Bonneville Power administration) has been cut by about one-third. Kaiser Aluminum & Chemical Corp., Reynolds Metals Co. and Aluminum Co. of America aluminum making facilities are affected. The cutback involves interruptible power which is purchased at a cheaper rate than other power. Firm contracts concerning the remainder of the power to the big three will not be affected. Extreme cold is the culprit. Crux: High cost power is available, but aluminum producers will probably wait for cheaper power to return.

Aluminum sales are average to good. Significant note: Washington sources report that Kaiser has offered the U.S. another 15,000 tons of aluminum under the "put right" provision of the Defense Production Act which states: If aluminum production developed for "defense capacity" cannot be sold, the government will buy it.

Tin Notes

Look for Wah Chang Corp. to remodel its recently acquired tin smelter (formerly the U.S. Texas City tin smelter) within six to eight months. Initially, tungsten will be the main metal processed.

The tin market will continue to hold near the 102.50 cent a pound mark during early February.

NONFERROUS PRICE RECORD

	Price Jan. 30	Last Change	Previous Price	Dec. Avg.	Nov. Avg.	Jan., 1956 Avg.
Aluminum ..	27.10	Aug. 10, 1956	25.90	27.100	27.100	24.400
Copper	34.75–36.00	Jan. 23, 1957	35.00–36.00	35.650	35.956	46.700
Lead	15.80	Jan. 13, 1956	16.30	15.800	15.800	15.960
Magnesium .	35.25	Aug. 13, 1956	33.75	35.250	35.250	32.500
Nickel	74.00	Dec. 6, 1956	64.50	70.880	64.500	64.500
Tin	103.00	Jan. 30, 1957	102.75	104.465	111.049	105.067
Zinc	13.50	Jan. 6, 1956	13.50	13.500	13.500	13.440

Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary ingots, 99 + %, deld.; MAGNESIUM, pig, 99.8%, Velasco, Tex.

(*Concluded from page 156*)

355 tons, buildings, College of Education, Providence, R.I., to Tower Iron Works, Providence, R.I.; E. Turgeon Construction Co. Inc., Providence, R.I., general contractor; 430 tons, bar joists, to the Builders Structural Steel Co., Cleveland.

325 tons, warehouse, Glen Canyon dam and power plant, Colorado river storage project, Bureau of Reclamation, to Middle River Division, Allison Steel Mfg. Co., Phoenix, Ariz.

315 tons, plant-office building, American Pad & Paper Co., Holyoke, Mass., to Haarmann Steel Co., Willimansett, Mass.

220 tons, Massachusetts pumping station, Buffalo, to Ernst Iron Works, Buffalo.

220 tons, addition, Kendall Station, Cambridge Electric Co., Cambridge, Mass., to A. O. Wilson Structural Co., Cambridge, Mass.

200 tons, building, Atlantic Roofing & Skylight Works, Arlington, Mass., to A. O. Wilson Structural Co., Cambridge, Mass.

180 tons, structurals and bars, junior high school, Avon, Conn., to City Iron Works, Hartford, Conn. (structurals) and Scherer Steel Co., East Hartford, Conn.; Wadhams & May Co., Bridgeport, Conn., general contractor.

STRUCTURAL STEEL PENDING

4250 tons, Ft. Pitt tunnel, route L.R. 766/2A-1, Pittsburgh; bids received by the Pensylvania Department of Highways March 1; also required are 1061 tons of reinforcing bars, 219 tons of steel wire fabric and 136 tons of miscellaneous metals.

3454 tons, state bridge work, over Schuylkill river, vicinity of 30th St. Pennsylvania station and Pennsylvania boulevard, Philadelphia; bids Feb. 21; 856 tons of reinforcing steel also required.

2374 tons, TI-5, East Hazel Crest, Ill., T7-7, North Chicago, Ill., and EI-12, Aurora, Ill., Northern Illinois toll highway contract SNI-3A, for the Illinois State Toll Highway Commission, Chicago; bids Feb. 14.

1400 tons, Northern Illinois toll highway, Tri-State route contract T7A, Cook county, Ill., for Illinois State Toll Highway Commission, Chicago; bids Feb. 7.

786 tons, bridges T2-1, Blue Island, Ill., and E2-4, Downers Grove, Ill., Northern Illinois toll highway contract SNI-3B, for the Illinois State Toll Highway Commission, Chicago; bids Feb. 14.

250 tons or more, power test facilities, reactor project; Arrington Construction Co., Idaho Falls, Idaho, low at $1,119,280, to Atomic Energy Commission; Andrew Gladney, Kentfield, Calif., low at $144,904 for rail spur.

500 tons, also 150 tons of reinforcing, naval hangar, etc., Adak, Alaska; Raber & Kief, and Beck Constructors, Seattle, joint low at $4,448,000.

386 tons, Northern Illinois toll highway, east-west route contract E-2A, Lisle and York townships, Dupage county, Ill., for the Illinois State Toll Highway Commission, Chicago; bids Feb. 14.

REINFORCING BARS . . .

REINFORCING BARS PLACED

3000 tons, Navy pier, Newport, R.I., to Bethlehem Steel Co., Bethlehem, Pa.; B. Perini & Sons Inc., Framingham, Mass., general contractor.

400 tons, admission treatment building, state hospital, Northampton, Mass., to Fabricated Steel Products Co., Boston; M. I. O'Connor Inc., Northampton, general contractor; structurals, Quincy Ornamental Iron Works, Boston.

345 tons, buildings, College of Education, Providence, R.I., to Plantations Steel Co., Providence, R. I.; E. Turgeon Construction Co. Inc., Providence, general contractor.

185 tons, high school, Canton, Mass., to U.S. Steel Supply Division, U.S. Steel Corp., Boston; Tocci Bros. Construction Co. Inc., Newtonville, Mass., general contractor.

160 tons, Lake City treatment plant, Seattle, to J. T. Ryerson & Son Inc., Seattle; G. R. Leischner Co., Seattle, is general contractor.

REINFORCING BARS PENDING

2250 tons, Northern Illinois toll highway, Tri-State route contract T7A, including erection of precast concrete and steel bridges, Cook county, Ill., for Illinois State Toll Highway Commisssion, Chicago; bids Feb. 7.

TRADE-MARKS WHICH IDENTIFY THE ORIGINAL AND THE BEST

"PHOSPHOR BRONZE."®

Phosphor Bronze®

ELEPHANT BRAND®

A little more than seventy-five years ago a wonderful new kind of copper and tin alloy possessing high tensile strength, great resiliency and unusual corrosion-resistant properties was introduced to American industry. This new bronze alloy had been perfected by the addition of a small amount of phosphorus to the copper and tin mixture.

No other producer of metals in the United States was able to duplicate this extraordinarily useful alloy. Therefore, because of the uniqueness of this new phosphorus-bearing *alloy*, the smelters responsible for its creation gave it a trade name "PHOSPHOR BRONZE" and adopted for itself the firm name of The Phosphor Bronze Smelting Company.

This was the first Phosphor Bronze ever produced in the United States of America.

"Phosphor Bronze" was immediately accepted by America's burgeoning industry. Demand for the new alloy grew by leaps and bounds and The Phosphor Bronze Smelting Company soon had many imitations of its products. So, to protect customers from spurious imitations, the trade name of "Phosphor Bronze" was incorporated into two distinctive *trademarks* which were duly registered in the U. S. Patent Office on February 21, 1888. These trade-mark registrations have been maintained, in full force, throughout the intervening years and are presently owned by The Phosphor Bronze Corporation, successors to the original Phosphor Bronze Smelting Company.

In time, new variations of the original "Phosphor Bronze" alloy were introduced by the now-famous smelting Company. To identify these, the trade name of "ELEPHANT BRAND" was adopted, together with a distinctive picture of an elephant. The words "ELEPHANT BRAND" were incorporated into a *trade-mark* and registered with the U. S. Patent Office on August 20, 1907. The picture of the elephant shown in this advertisement, is a new one, designed to supersede its 1906 predecessor and was Registered, as a *trademark*, on October 2, 1956.

We are proud that American industry has wholeheartedly accepted our product. The name "PHOSPHOR BRONZE" has become internationally known and is familiar to metalworking men and metallurgists everywhere.

In view of this unanimous acceptance and usage, we—the officers, stockholders and employees of The Phosphor Bronze Corporation acknowledge the universal use of the name and herewith bequeath it to the American metalworking industries. We reserve only . . . the exclusive right to use the trademarks illustrated above.

THE PHOSPHOR BRONZE CORPORATION

A Wholly Owned and Operated Subsidiary of The Seymour Manufacturing Company

SEYMOUR, CONNECTICUT

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99+%, ingots 27.10; pigs, 25.00, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 28.90; No. 43, 28.70; No. 195, 30.30; No. 214, 30.50; No. 356, 28.90. 30-lb ingots.

Antimony: R.M.M. brand, 99.5%, 33.00; Lone Star brand, 33.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.50-28.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb ton lots.

Cadmium: Sticks and bars, $1.70 per lb deld.

Cobalt: 97-99%, $2.35 per lb for 550-lb keg; $2.37 per lb for 100-lb case; $2.42 per lb under 100 lb.

Columbium: Powder, $119.20 per lb, nom.

Copper: Electrolytic, 36.00 deld. Conn. valley; 36.00 deld. Midwest; custom smelters, 34.75 deld.; lake, 36.00 deld.; fire refined, 35.75 deld.

Germanium: First reduction, $201.85-$220 per lb; intrinsic grade, $220-$242.67 per lb, depending on quantity.

Gold: U.S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $100-$110 nom. per troy oz.

Lead: Common, 15.80; chemical, 15.90; corroding, 15.90, St. Louis. New York basis, add 0.20.

Lithium: 98+%, cups or ingots, $11.50; rod, $13.50; shot or wire, $14.50, f.o.b. Minneapolis, 100 lb lots.

Magnesium: Pig, 35.25; ingot, 36.00, f.o.b. Velasco, Tex. 13 in. sticks, 59.00, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91B (diecasting), 37.25 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $255-$257 per 76-lb flask.

Molybdenum: Extruded ingot, $9.60 per pound, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot or ingots for addition to cast iron, 74.50; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01.

Osmium: $80-$100 per troy oz, nom.

Palladium: $23-$24 per troy oz.

Platinum: $98-$101 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $118-$125 per troy oz.

Ruthenium: $45-$55 per troy oz.

Selenium: 99.5%, $12.00-$15.00 per lb.

Silver: Open market, 91.375 per troy oz.

Sodium: 16.50, c.l.; 17.00, l.c.l.

Tantalum: Sheet, rod, $68.70 per lb; powder, $56.63 per lb.

Tellurium: $1.65 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N.Y., spot, 103.00; prompt, 102.875.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max), $2.75; grade A-2 (0.5% Fe max), $2.50 per pound.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $4.20 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99+% hydrogen reduced, $5. Treated ingot, $6.70.

Zinc: Prime Western, 13.50; brass special, 13.75; intermediate, 14.00, East St. Louis. freight allowed over 0.50 per pound. New York basis, add 0.50. High grade, 14.85; special high grade, 15.25 deld. Die casting alloy ingot No. 3, 18.00; No. 2, 19.00; No. 5, 18.50 deld.

Zirconium: Ingots, commercial grade, $14.40 per lb; low-hafnium reactor grade, $23.07. Sponge, commercial grade, $10 per lb; reactor grade, $14-$22 per lb, depending on quantity. Powder electronics grades, $15 per lb; flash grade, $11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 23.75-26.00; No. 12 foundry alloy (No. 2 grade), 22.50-23.00; 5% silicon alloy, 0.60 Cu max, 24.75-25.50; 13 alloy, 0.60 Cu max, 24.75-25.50; 195 alloy, 24.50-26.25; 108 alloy, 22.50-23.00. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 23.25; grade 2, 21.75; grade 3, 21.00; grade 4, 20.25.

Brass Ingot: Red brass, No. 115, 34.00; tin bronze, No. 225, 43.50; No. 245, 38.00; high-leaded tin bronze, No. 305, 37.50; No. 1 yellow, No. 405, 26.50; manganese bronze, No. 421, 29.75.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 37.50; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nominal 1.9% Be alloy.) Strip, $1.86-$1.91, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.88, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 30,000-lb lots, 41.355; l.c.l., 41.98. Weatherproof, 30,000-lb lots, 40.78; l.c.l., 41.53. Magnet wire deld., 15,000 lb or more, 48.68; l.c.l., 49.43.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $21.50 per cwt; pipe, full coils, $21.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheets and strip, $11.00-$14.75; sheared mill plate, $9.25-$11.25; wire, $8.50-$11.00; forging billets, $6.85-$7.10; hot-rolled and forged bars, $7.10-$7.35.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 24.00; ribbon zinc in coils, 21.50; plates, 20.00.

ZIRCONIUM

Plate, $20.35; H.R. strip, $23.95; C.R. strip, $32.00; forged or H.R. bars, $18.40; wire, 0.015 in., 8.00c per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strip, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheet and Circles: 1100 and 3003 mill finish (30,000 lb base; freight allowed)

Thickness Range, Inches	Flat Sheet	Coiled Sheet
0.249-0.138	40.90-45.40	.....
0.135-0.096	41.40-46.50	37.70-39.60
0.095-0.077	42.10-48.30	37.80-39.80
0.076-0.061	42.70-50.60	38.20-40.50
0.060-0.048	43.40-52.90	38.80-41.50
0.047-0.038	43.90-55.60	38.60-42.90
0.037-0.030	44.30-50.00	40.40-44.70
0.029-0.024	44.90-52.40	41.00
0.023-0.019	45.80-52.20	42.00
0.018-0.017	46.60-53.30	42.60
0.016-0.015	47.50-53.90	43.40
0.014	48.50-50.90	44.40
0.013-0.012	49.70-52.10	45.10
0.011	50.70-53.70	46.30
0.010-0.0095	52.10-54.40	47.60
0.009-0.0085	53.40	49.10
0.008-0.0075	55.00	50.03
0.007	56.50	51.80
0.006	58.10	53.20

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	40.2	44.5
5050-F	41.3	45.6
3004-F	42.3	47.5
5052-F	42.9	48.2
6061-T6	44.4	50.0
2024-T4*	48.1	54.4
7075-T6*	55.4	62.5

*24-48 in. widths or diam., 72-180 lengths.

Screw Machine Stock: 30,000 lb base.

Diam., (in.) or across flats	—Round— 2011-T3	2017-T4	—Hexagonal— 2011-T3	2017-T4
Drawn				
0.125	74.30	71.50	....	....
0.156-0.172	63.00	60.40	....	....
0.188	63.00	60.40	....	76.40
0.219-0.234	59.70	57.20	....	....
0.250-0.281	59.70	57.20	....	73.00
0.313	59.70	57.20	....	69.60
0.344	58.50	....	....	....
Cold-finished				
0.375-0.547	58.80	57.50	70.10	65.50
0.563-0.688	58.80	57.50	66.70	61.60
0.750-1.000	57.40	56.00	61.00	58.10
1.063	57.40	56.00	....	56.10
1.125-1.500	55.20	53.90	59.00	56.10
Rolled				
1.563	53.70	52.40	....	....
1.625-2.000	53.10	51.60	....	....
2.125-2.500	51.70	50.30	....	....
2.563-3.375	50.20	48.70	....	....

Forging Stock: Round, Class 1, 43.30-55.90 in specific lengths 36-144 in., diameters 0.375-8 in. Rectangles and squares, Class 1, 48.10-63.20 in random lengths, 0.375-4 in. thick, width 0.750-10 in.

Pipe: ASA schedule 40, alloy 6063-T6, standard lengths, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
¾	$18.45	2	$ 57.00
1	29.00	4	157.20
1¼	39.25	6	281.65
1½	46.95	8	423.80

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	45.90-47.50	61.50-65.80
12-14	46.20-47.70	62.20-66.80
15-17	46.40-48.30	63.50-68.50
18-20	47.00-48.80	65.50-71.10

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grade, .032 in., 171.30; .081 in., 108.70; .125 in., 98.10; .188 in., 95.70; .250-2.0 in., 93.30. Thread plate, .188 in., 71.70; .250-2.0 in., 70.60; Tooling plate, .250-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 1100 clippings, 13.00-13.50; old sheets, 8.00-8.50; borings and turnings, 6.00-

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	58.13b	55.36c	....	58.32	32.000	32.000	31.250
Yellow Brass	50.19	40.17d	50.73	53.10	24.625	24.375	22.625
Low Brass, 80%	53.40	53.34	53.94	56.21	27.375	27.125	26.625
Red Brass, 85%	54.54	54.48	55.08	57.35	28.500	28.250	27.750
Com. Bronze, 90%	56.23	56.17	56.77	58.79	29.500	29.250	28.750
Manganese Bronze	57.88	51.98	62.22	....	23.000	22.750	22.250
Muntz Metal	52.19	48.90	....	....	23.125	22.875	22.375
Naval Brass	54.14	48.45	61.20	57.55	23.000	22.750	22.250
Silicon Bronze	62.44	61.63	62.48	64.61	31.250	31.000	30.250
Nickel Silver, 10%	66.66	68.99g	68.99	....	30.875	30.675	15.438
Phos. Bronze, A 5%	77.25	77.75	77.75	79.18	33.000	32.750	31.750

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded

6.50; crankcase, 8.00-8.50; industrial castings, 8.00-8.50.

Copper and Brass. No. 1 heavy copper and wire, 25.50-26.00; No. 2 heavy copper and wire, 24.50-25.00; light copper, 21.50-22.00; No. 1 composition red brass, 23.00-23.50; No. 1 composition turnings, 22.00-22.50; yellow brass turnings, 13.00-13.50; new brass clippings, 20.50-21.00; light brass, 13.50-14.00; heavy yellow brass, 15.00-15.50; new brass rod ends, 18.00-18.50; auto radiators, unsweated, 16.50-17.00; cocks and faucets, 17.50-18.00; brass pipe, 18.00-18.50.

Lead: Heavy, 12.50-13.00; battery plates, 6.50-7.00; linotype and stereotype, 13.00-14.00; electrotype, 12.50-13.00; mixed babbitt, 13.00-13.50.

Monel: Clippings, 30.00-85.00; old sheets, 75.00-80.00; turnings, 60.00-75.00; rods, 80.00-90.00.

Nickel: Sheets and clips, 150.00-185.00; rolled anodes, 150.00-185.00; turnings, 130.00-160.00; rod ends, 150.00-185.00.

Zinc: Old zinc, 4.50-5.00; new die-cast scrap, 3.75-4.00; oil die-cast scrap, 2.25-2.50.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings, 17.00; 3003 clippings, 17.00; 6151 clippings, 17.00; 5052 clippings, 16.50-17.00; 2014 clippings, 16.00-16.50; 2017 clippings, 16.00-16.50; 2024 clippings, 16.00-16.50; mixed clippings, 16.00; old sheets, 14.00; old cast, 14.00; clean old cable (free of steel), 16.00-17.00; borings and turnings, 14.00-15.00.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 58.00; light scrap, 54.00; turnings and borings, 38.00

Copper and Brass: No. 1 heavy copper and wire, 27.75; No. 2 heavy copper and wire, 26.25; light copper, 24.00; refinery brass (60% copper) per dry copper content, 25.00.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper and Brass: No. 1 heavy copper and wire, 27.75; No. 2 heavy copper and wire, 26.25; light copper, 24.00; No. 1 composition borings, 25.25; No. 1 composition solids, 25.75; heavy yellow brass solids, 17.50; yellow brass turnings, 16.50; radiators, 19.50.

PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.70 per lb.

Copper: Flat-rolled, 54.79; oval, 53.92, 5000-10,000 lb; electrodeposited, 45.78; 2000-5000 lb lots; cast, 48.04, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, $1.015; 100-499 lb, 99.50; 500-4999 lb, 95.50; 5000-29,999 lb, 93.50; 30,000 lb, 91.50. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab; less than 200 lb, 121.50; 200-499 lb, 120.00; 500-999 lb, 119.50; 1000 lb or more, 119.00.

Zinc: Balls, 21.00; flat tops, 21.00; flats, 22.75; ovals, 22.00, ton lots.

CHEMICALS

Cadmium Oxide: $1.70 per lb, in 100-lb drums.

Chromic Acid: 100 lb, 33.20; 500 lb, 32.70; 2000 lb, 32.05; 5000 lb, 31.75; 10,000 lb, 31.25, f.o.b. Detroit.

Copper Cyanide: 100-1000 lb, 77.50.

Copper Sulphate: 100 lb, 26.65; 200 lb, 23.65; 300 lb, 22.65; 400 lb 22.15; 500 lb, 20.65; 2000 lb, 18.40; 600 lb, 18.15; 12,000 lb, 17.90, f.o.b. shipping point.

Nickel Chloride: 100 lb, 48.50; 200 lb, 46.50; 300 lb, 45.50; 400 lb, 43.50; 5000 lb, 41.50; 10,000 lb, 40.50.

Nickel Sulphate: 100 lb, 40.50; 200 lb, 38.50; 300 lb, 37.50; 400 lb, 35.50; 5000 lb, 33.50; 20,000 lb, 33.00; 36,000 lb, 32.50.

Sodium Cyanide: 100 lb, 27.50; 200 lb, 25.80; 400 lb, 22.80; 1000 lb, 21.80, f.o.b. Detroit.

Sodium Stannate: Less than 100 lb, 80.10; 100-600 lb, 70.70; 700-1900 lb, 68.00; 2000-9900 lb, 66.10; 10,000 lb or more, 64.80.

Stannous Chloride (anhydrous): Less than 25 lb, 170.20; 25 lb, 135.20; 100 lb, 120.20; 400 lb, 117.70; 5200-19,600 lb, 105.50; 20,000 lb or more, 93.30

Stannous Sulphate: Less than 50 lb, 132.70; 50 lb, 102.70, 100-1900 lb, 100.70; 2000 lb or more, 98.70.

Zinc Cyanide: Under 1000 lb, 55.55; 1000 lb and over, 53.55.

(*Concluded from page* 169)

cold weather slowed collections and processing.

Buffalo—New business is lacking at the mill level, but scrap prices are down nominally $3 to $4 a ton on the basis of brokers' offerings. New mill orders, expected early this month, are likely to reflect a decline of at least $3 a ton. Some observers think the drop may range up to $6. Dealers are shipping against January orders at the recent high prices. Supplies remain tight, and there are no large accumulations at dealers' yards.

Detroit—Scrap prices are still declining here. The automotive lists are off $10 to $11 from last month's and this should mean that brokers' buying prices will likely be down at least $4 to $5 a ton. The cast grades are holding fairly well.

Cincinnati — Brokers' buying prices dipped again last week, slipping another $2 a ton on No. 1 heavy melting steel. Other grades moved down $1 to $2 a ton.

Birmingham—Cast scrap is firm, but other grades are quoted lower. Brokers are offering No. 2 open-hearth material at $2 to $3 a ton under recent sales. They are holding No. 1 grades unchanged. Electric furnace grades were cut twice last week by some consumers, resulting in a drastic drop in some items.

The long strike at Woodward Iron Co. (which has considerably reduced the amount of pig iron available) is keeping cast scrap prices up.

St. Louis—Scrap prices continue to decline here. Cast grades are off $1 to $3 a ton, 18-in. rails, and under, are down $3 to $76; angles and splice bars also are off $3 to $66. More scrap is available than can be sold despite bad weather and hampered collections. Mill inventories are comfortable.

FOR SALE
SHALCO SHELL MOLDING MACHINE
Model HO-4
Used machine in excellent condition. Complete with standard heater plates and cycle timer.
D. C. Hartman
COVE PATTERN WORKS, INC.
2401 W. Superior Cleveland 13, Ohio

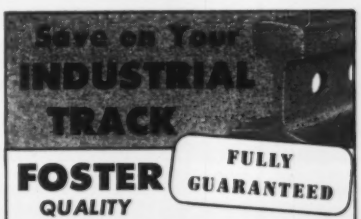
STAFF ENGINEERS

Kaiser Steel's multi-million dollar expansion program has created permanent openings in Plant Engineering Department at our Fontana plant.

Attractive staff engineering assignments available on large construction program involving rolling mills and steel making facilities.

Send resume including salary requirements to

Employment Manager
KAISER STEEL CORP.
P. O. Box 217
Fontana, California



FOSTER QUALITY — FULLY GUARANTEED
RELAYING RAILS
Handle more cars better—cost less to install and maintain. Foster stocks all Rail Sections 12# thru 175#, Switch Material and Track Accessories.
SEND FOR CATALOGS
RAILS TRACK EQUIPMENT PIPE PILING
L B FOSTER co.

CARBON STEEL **CASTINGS**
Submit print for prompt quotation
Immediate delivery
Standard Electric Steel Casting Co.
221 E. Chase Springfield, Mo.
Ph. 2-9288

CLASSIFIED

Help Wanted

METALLURGIST—For producer of stainless steel. Quality control of production of stainless ingots; customer service contacts related to special usage. Plant located on central East Coast. Metallurgical graduate; stainless experience preferred but not essential. Permanent position; good salary with merit increases. In reply please give personal data, education, employment history, salary desired. Box 509, STEEL, Cleveland 13, Ohio.

STRUCTURAL STEEL PLANT SUPERINTENDENT

Progressive Midwest fabricator has an opening for high caliber man with broad experience in supervising the production of a structural plant. Firm has AAA rating, and has been in business for over 100 years. Salary five figures and up. Inexperienced men need not apply.

Reply Box 508, STEEL
Penton Bldg. Cleveland 13, Ohio

For GEARS to build AMERICA'S ROADS

GEARS, thousands of them, will go into the construction machinery needed for our nationwide program of building highways and roads. An increasing number of these will be Fairfield Gears. Already one of America's largest independent producers, Fairfield's facilities are being further enlarged this year with approximately one hundred percent more space in heat treating and thirty-three percent more space for machine installations.

If you use gears in the product you make, we believe it will pay you, as it has others, to become acquainted with FAIRFIELD —the place where fine gears and differentials are produced to meet your specifications EFFICIENTLY, ECONOMICALLY! *Your inquiry will receive prompt attention.*

FAIRFIELD
MANUFACTURING CO.
2313 S. Concord Rd. Lafayette, Indiana

Fine Gears For FINE GEARS *Made to Order*

TRACTORS • CONSTRUCTION MACHINERY • ENGINES • BUSES • FARM IMPLEMENTS • MINING MACHINERY
DIESEL LOCOMOTIVES • MACHINE TOOLS • AIRPLANES • HEAVY DUTY TRUCKS • OIL FIELD EQUIPMENT

Seattle — Although the scrap market appears a trifle weaker, current prices are holding. Until the large buyers announce their February prices, no change in the list is anticipated. Turnover is substantial, both on domestic and export account. Receipts continue large despite unfavorable weather.

The U.S. Engineer, Portland, Oreg., has received bids on scrap, including rail and sheet piling, at The Dalles project. Alaska Junk Co. was high for 393.5 gross tons at $5740, and for 32.46 gross tons at $1990. Reliance Overseas Co., Seattle, bid high at $4640 for 96.5 tons, and Zidell Machinery & Supply Co., Portland, bid $396 for 8.08 gross tons.

Los Angeles—Prices are erratic, pending export buying. No. 2 bundles have fallen another $2 and are being quoted at $38. Machine shop turnings are quoted $3 higher at $35.

San Francisco — Steel scrap prices are holding at the recently established record level.

Washington — Consumption of ferrous materials (scrap and pig iron) in November totaled 12,550,000 gross tons, of which 6,315,000 tons were scrap and 6,235,000 tons pig iron. Compared with consumption in October, scrap was down 6 per cent, pig iron 3 per cent.

Canada . . .

Canada produced 298,900 net tons of pig iron in November, compared with 307,630 in October and 284,372 in November, 1955. In the first 11 months of the year, 3,254,406 net tons were turned out, against 2,931,829 in the like 1955 period.

Production of ingots and steel for castings in November amounted to 444,434 net tons. This compared with 466,175 in October and 415,477 in November, 1955. For the first 11 months of the year, output was 4,855,667 net tons. It was 4,106,274 in the similar 1955 period.

The Canadian National Railways has placed orders for 222 diesel locomotives at a cost of $44,700,000. Of the total, 132 will be built by General Motors Diesels Ltd., London, Ont., and 90 by the Montreal Locomotive Works Ltd., Montreal.

Advertising Index

Acme-Newport Steel Co. 146
Air Reduction Sales Co., A Division of Air Reduction Co. 88, 89
Ajax Electrothermic Corporation 29
Alan Wood Steel Co. 129
Aldrich Pump Co., The 97
Alloy Metal Products, Inc. 148
Alloy Metal Wire Division, H. K. Porter Company, Inc. 92
Alloys & Metal Specialties, Inc. 169
American Brake Shoe Co., Denison Engineering Division 44
American Chemical Paint Co. 94
American-Standard, Ross Heat Exchanger Division 38
American Steel & Wire Division, United States Steel Corporation 37
Armco Steel Corporation 56
Avey Drilling Machine Co., The 20, 21

Babcock & Wilcox Co., Tubular Products Division . . . . . Inside Front Cover
Baldwin-Lima-Hamilton Corporation, Loewy-Hydropress Division 7
Basic, Inc. 109
Bethlehem Steel Co. 1
Bliss, E. W., Co. 35
Broderick & Bascom Rope Co. 167
Browning, Victor R., & Co., Inc. 168
Buffalo Forge Co. 36
Bullard Co., The 49

C & D Batteries, Inc. 122
Cannon-Muskegon Corporation 10
Chicago Concrete Breaking Co. 26
Chicago Steel Service Co. 113
Chicago Tool & Engineering Co. 168
Cleveland Crane & Engineering Co., The . . . 93
Cleveland Worm & Gear Co., The . . . . . Inside Back Cover
Coles Cranes, Inc. 132
Colorado Fuel & Iron Corporation, The 18, 19, 25
Columbia-Geneva Steel Division, United States Steel Corporation 37
Conco Engineering Works, Division of H. D. Conkey & Co. 143
Cone Automatic Machine Co., Inc. 46
Continental Steel Corporation 23
Coolidge Corporation 79
Cross Co., The 8, 9
Crucible Steel Company of America 178
Cullen-Friestedt Co. 144

Denison Engineering Division, American Brake Shoe Co. 44
Despatch Oven Co. 13
Dexter Folder Co. 142
Diamond Manufacturing Co. 16
Dixon, Joseph, Crucible Co., The 177
DoAll Co., The 152
Dreis & Krump Manufacturing Co. 12
Drop Forging Association 95
Duraloy Co., The 140
Dykem Co., The 167

Eastern Machine Screw Corporation, The . . 168
Eastman Kodak Co., X-ray Division 145
Eaton Manufacturing Co., Dynamatic Division 68
Enterprise Galvanizing Co. 168
Enthone, Inc. 22
Eureka Fire Brick Works 169

Fairfield Manufacturing Co. 176
Foster, L. B., Co. 175
Frasse, Peter A., & Co., Inc. 2

Garlock Packing Co., The 121
General American Transportation Corporation, Parker-Kalon Division 139
General Motors, New Departure Division . . . 75
General Motors Corporation, Hyatt Bearings Division 72
Globe Steel Abrasive Co., The 138
Green, A. P., Fire Brick Co. 42
Greenlee Bros. & Co. 27

Harper, H. M., Co., The 126, 127
Harrington & King Perforating Co., Inc., The 142
Herr Equipment Corporation, The 96
Hill Acme Co., The, Cleveland Knife Division 168
Hobart Brothers Co. 3
Hyatt Bearings Division, General Motors Corporation 72

International Nickel Co., Inc., The 52
Ironsides Co., The 40, 41

Johnson Bronze Co. 48
Jomac, Inc. 78

Kaiser Steel Corporation 175
Kardong Brothers, Inc. 167
Kendall Co., The, Polyken Sales Division . . 91
Kinnear Mfg. Co., The 131

Loewy-Hydropress Division, Baldwin-Lima-Hamilton Corporation 7
Logansport Machine Co., Inc. 87
Logemann Brothers Co. 171
Lynchburg Foundry Co. 4

McGill Manufacturing Co., Inc. 98

Manning, Maxwell & Moore, Inc., Shaw-Box Crane & Hoist Division 114
Mesta Machine Co. . . . . Back Cover
Michigan Chrome & Chemical Co. 168
Milford Rivet & Machine Co., The 130
Mississippi Agricultural & Industrial Board . . 128
Morgan Construction Co. 67
Morse Twist Drill & Machine Co. 30, 31
Mundt, Charles, & Sons 156

National Refining Co. 144
National-Standard Co. 47
National Steel Corporation 33
New Britain Machine Co., The, Lucas Machine Division 43
New Departure, Division of General Motors 75
Niagara Blower Co. 128
Niagara Machine & Tool Works 14, 15
Nicholson File Co. 111

Ohio Steel Foundry Co., The 80
Owen Bucket Co., The 167

Parker-Kalon Division, General American Transportation Corporation 139
Peterson Steels, Inc. 90
Phosphor Bronze Corporation, The 173
Pickands Mather & Co. 39
Polyken Sales Division, The Kendall Co. . . . 91
Porter, H. K., Company, Inc., Alloy Metal Wire Division 92
Potter & Johnston Co. 141
Pratt & Whitney Co., Inc. 136, 137

Reliance Electric & Engineering Co. 85
Republic Steel Corportion 116, 117
Roebling's, John A., Sons Corporation, A Subsidiary of The Colorado Fuel & Iron Corporation 25
Rollway Bearing Co., Inc. 24
Ross Heat Exchanger Division of American-Standard 38

Seymour Manufacturing Co., The 173
Shaw-Box Crane & Hoist Division, Manning, Maxwell & Moore, Inc. 114
Simonds Saw & Steel Co. 50
SKF Industries, Inc. 134
Square D Co. 153
Stalwart Rubber Co. 150
Stamco, Inc. 168
Standard Pressed Steel Co., Socket Screw Division 133
Stanley Works, The, Stanley Steel Strapping Division 51
Sterling Wheelbarrow Co. 155
Superior Tube Co. 83

Tennessee Coal & Iron Division, United States Steel Corporation 37
Thomas Flexible Coupling Co. 151
Timken Roller Bearing Co., The, Steel & Tube Division 76
Torrington Co., The 55

Udylite Corporation, The 135
United States Steel Corporation, Subsidiaries 37
United States Steel Export Co. 37

Valley Mould & Iron Corporation 58

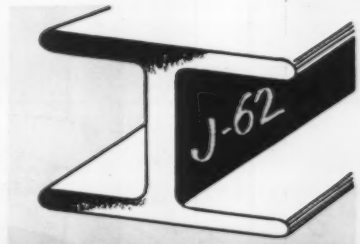
Wales-Strippit Co. 107
Walsh Refractories Corporation 6
Warner & Swasey 125
Wean Engineering Co., Inc., The 17
Weirton Steel Co. 33
Wheelabrator Corporation 32
Wheland Co., The, Foundry Division 28
Whiting Corporation 45
Wickwire Spencer Steel Division of The Colorado Fuel & Iron Corporation 18, 19
Wysong & Miles Co. 11

Yoder Co., The 156
Youngstown Sheet & Tube Co., The 34

~ ~ ~

Table of Contents, Page 5

Classified Advertising, Page 175



All over America... this crayon means

Vivid Permanent Markings

that remain clearly visible!

MARKS LUMBER, STEEL, IRON, CONCRETE . . . . . .

Write for a FREE SAMPLE!
Specify the surface to be marked.

In Red, Yellow, Blue and 9 other highly visible colors
Sold everywhere in Mill Supply Houses, Hardware Supply Firms, Industrial Supply Distributors and Engineering Supply Firms. Be Sure To Specify:

DIXON
LUMBER CRAYONS!

THE JOSEPH DIXON CRUCIBLE CO.
PENCIL SALES DIVISION
167 Wayne Street Jersey City 3, N. J.

want prompt service?

Every warehouse and branch office in Crucible's growing countrywide chain is geared to fill your special steel orders *quickly* . . . efficiently, too . . . no matter how large or small they are.

And – whether you want to stop by and pick up a single tool bit or drill rod from our shelves . . . or have us deliver a truckload tomorrow – every piece you buy is made to the Crucible high standard of quality. For all your special steel requirements, call Crucible – *big enough to serve you . . . small enough to want to.*

Stocks maintained of:

Rex High Speed Steel . . . ALL grades of Tool Steel (including Die Casting Die and Plastic Mold Steel, Drill Rod, Tool Bits, and Hollow Tool Steel Bars) . . . Stainless Steel (Sheets, Bars, Wire, Billets, Electrodes) . . . Max-el, HY-Tuf, AISI Alloy . . . Onyx Spring, Hollow Drill Steel and other special purpose steels.

CRUCIBLE WAREHOUSE SERVICE

Crucible Steel Company of America

Major chemical producer meters flow of catalytic agents with Cleveland Speed Variator

A chemical research worker adjusts the manual control knob on the Cleveland Speed Variator to set the metering speed. Various types of regulating mechanisms can be mounted on the Variator to provide automatic adjustment by remote control.

IN the research department of a major chemical plant, catalytic agents are metered and their flow varied with precision accuracy. This control is exercised with a Cleveland Speed Variator.

A ¼-horsepower electric motor is connected to the Cleveland Speed Variator driving a pump through a 25-1 speed reducer. Being infinitely variable, the Variator gives stepless speeds over its full 9:1 range—from ⅓ to 3 times input speed. Pumping speed can be varied from 207 to 23 rpm. This provides the necessary speed range for metering the various types of catalytic agents.

Available in eighteen standard types and sizes, the Cleveland Speed Variator offers these major advantages: 1. An extremely compact unit; 2. Almost any input speed up to 1800 rpm—clockwise or counterclockwise; 3. Constant horsepower output over a 9:1 range, or constant output torque with a 6:1 range; 4. Infinitely variable over entire speed range; 5. Rapid response to speed change, precise adjustment, accurate maintenance of settings; 6. Long life and minimum maintenance; 7. Ample bearing support for overhung pulleys on either input or output shafts.

Write for Bulletin K-200 for detailed description of the Cleveland Speed Variator, with photographs, sectional drawings, rating tables and specifications.

THE CLEVELAND WORM AND GEAR COMPANY

Speed Variator Division, 3270 East 80th St., Cleveland 4, Ohio

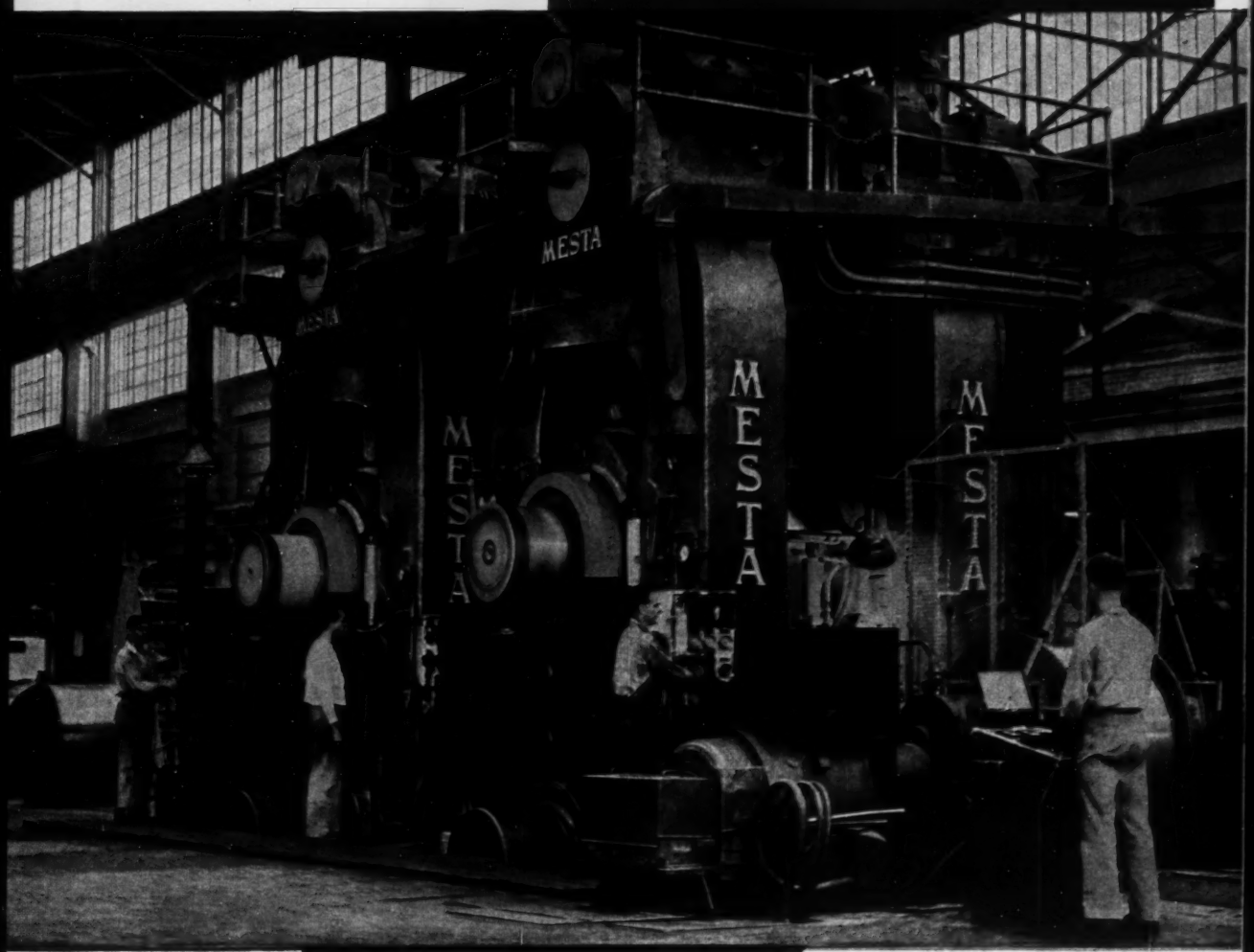
Sales representatives in all major industrial markets. In Canada—Peacock Brothers Limited.

Designed and Built by

MESTA

HIGH-SPEED

COLD MILLS



Mesta 42" Four-High Twin-Stand
High-Speed Skin Pass Mill

Designers and Builders of Complete Steel Plants

MESTA MACHINE COMPANY

PITTSBURGH, PENNSYLVANIA